

University of Florida
College of Public Health & Health Professions Syllabus
PHC6052: Introduction to Biostatistical Methods (3 credit hours)
Fall 2024
Delivery Format: On-campus
Course Website: <http://elearning.ufl.edu/>

Instructor Name: Jonathan Fischer, PhD
Room Number: HPNP G307
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Office Hours: TBA
Teaching Assistants: TBA
Preferred Course Communications:

- To ask specific questions or discuss issues of a personal nature, please use the Canvas inbox in E-learning.
- To ask general questions, please post on the discussion board in E-learning.
- **NOTE: My email address is jfischer1@ufl.edu. There is another person with a nearly identical name and similar email address. Consequently, I prefer you use the Canvas inbox. However, if you need to email me directly, be sure to use the correct address as shown here. I typically respond to questions within one business day, so please verify that you used the correct address if you don't receive a response in that time.**

Prerequisites

There are no specific prerequisite courses, but students should be comfortable working with equations, performing basic mathematical calculations (e.g., order of operations, fractions, and square roots), and working with computers.

PURPOSE AND OUTCOME

Course Overview

Students will develop statistical vocabulary, learn methods for descriptive data analysis, study the fundamentals of probability and sampling distributions, learn methods for statistical inference and hypothesis testing based on one or two samples, and become familiar with categorical data analysis and linear regression. Data analysis will be conducted in SAS.

Relation to Program Outcomes

This three-credit course is a required concentration core course for MPH Biostatistics students and covers the following competencies.

- Describe the role of biostatistics in public health research.
- Use appropriate statistical methodology to address public health problems.
- Apply software to conduct statistical analyses.

Course Objectives and/or Goals

Upon successful completion of this course, students will be able to

- 1) Describe the role biostatistics serves in the discipline of public health.
- 2) Differentiate among different sampling methods and discuss their strengths and limitations.
- 3) Describe the strengths and limitations of designed experiments and observational studies.
- 4) Distinguish among different measurement scales, choose the appropriate descriptive and inferential statistical methods based on these distinctions, and interpret the results.
- 5) Determine preferred methodological alternatives to commonly used statistical methods when assumptions are not met.
- 6) Apply basic concepts of probability, random variation, and commonly used statistical probability distributions.
- 7) Use statistical software to analyze public health data.
- 8) Develop presentations based on statistical analyses for both public health professionals and educated lay

audiences.

What is expected of you?

You are expected to actively engage in the course throughout the semester. You must come to class prepared by completing all out-of-class assignments. This preparation gives you the knowledge or practice needed to engage in higher levels of learning during the live class sessions. If you are not prepared for the face-to-face sessions, you may struggle to keep pace with the activities occurring in the live sessions, and it is unlikely that you will reach the higher learning goals of the course. Similarly, you are expected to actively participate in the live class. Your participation fosters a rich course experience for you and your peers that facilitates overall mastery of the course objectives.

DESCRIPTION OF COURSE CONTENT

Topical Outline/Course Schedule

Week	Topic(s)	Due
1 8/19-8/23	Unit 1A EDA for One Variable	Fri 8/23 - Q1: Syllabus - A0: SAS verification - A1: Self-assessment
2 8/26-8/30	Unit 1B EDA for Two Variables	Tue 8/27 - Q2: 1-variable EDA Thu 8/29 - A2A: 1-variable EDA
3 9/2-9/6	Unit 2 Producing Data	Tue 9/3 - Q3: 2-variable EDA Thu 9/5: - A2B: 1-variable EDA
4 9/9-9/13	Unit 3A Probability	Tue 9/10 - Q4: Producing Data Thu 9/12: - A3A: Cases CC & CQ EDA
5 9/16-9/20	Unit 3B Discrete Random Variables	Tue 9/17 - Q5: Probability Thu 9/19: - A3B: Cases CC & CQ EDA
6 9/23-9/27	Unit 3B Continuous Random Variables	Tue 9/24 - Q6: Discrete RV Thu 9/26: - A4: Independent Events
7 9/30-10/4	Unit 3B Sampling Distributions	Tue 10/1 - Q7: Continuous RV Thu 10/3:

		- A5A : 2-variable EDA
8 10/7-10/11	Unit 4A Estimation	Tue 10/8 - Q8: Sampling Distributions Thu 10/10: - Project Step 1
9 10/14-10/18	Unit 4A Hypothesis Testing	Tue 10/15 - Q9: Estimation Thu 10/17: - A5B: 2-variable EDA
10 10/21-10/25	Unit 4B Inference for Case CQ	Tue 10/22 - Q10: Hypothesis testing Thu 10/24: - Project Step 2
11 10/28-11/1	Unit 4B Inference for Case CQ	Tue 10/29 - Q11: Case CQ I Thu 10/31: - Happy Halloween!
12 11/4-11/8	Unit 4B Inference for Case CC	Tue 11/5 - Q12: Case CQ II Thu 11/7: - Project Step 3
13 11/11-11/15	Unit 4B Inference for Case QQ	Tue 11/12 - Q13: Case CC Thu 11/14: - A6: Literature Examples
14 11/18-11/22	Additional Topics	Tue 11/19 - Q14: Case QQ Thu 11/21: - A7: Inference with Data
15 11/25-12/1	Happy Thanksgiving!	
16 12/2-12/6	Wrap-up and review	Tue 12/3 - Q15: Ethics Tue 12/10: - A8: Self-assessment 2 - Project Step 4

Course Materials and Technology

All course materials are available online through **Canvas** (<http://clearning.ufl.edu>). This includes our **online open access textbook** has been converted into a Canvas page that you will have access to. You will also need access to the statistical

software package, SAS (see details below). There is no required textbook to purchase for this course. However, the following textbooks may serve as useful references with additional examples/exercises:

Statistics resources:

- Daniel, W.D. (2013): Biostatistics: A Foundation for Analysis in the Health Sciences. 10th Edition, Wiley.
- Agresti, A. (2013): The Art and Science of Learning from Data. 4th Edition, Pearson.

SAS resources:

- The Little SAS Book: A Primer 5th ed., by Lora Delwiche and Susan Slaughter, SAS Institute: Cary, NC (2012).
- SAS Statistics by Example, by Ron Cody, SAS Institute: Cary, NC (2011).

IMPORTANT: Some course materials discuss multiple software packages. **In PHC 6052 you are only responsible for SAS.**

Videos

Tutorial videos are provided in the online textbook and are hosted on YouTube. Many of these videos have closed captions and/or transcripts available. In addition, recorded lectures and/or demos will be posted at the start of each week. Lectures will largely recap course readings while demos will allow me to walk through examples for you.

Statistical Software – SAS

The current version of SAS is SAS 9.4, and SAS 9.3 or higher is required for this course. There are two main options for SAS access:

- 1) Direct purchase and installation. **This option is only available for Windows users.** SAS can be purchased on campus at the UF computing help desk located at 132 HUB Stadium Road (<https://software.ufl.edu/software-listings/sas.html>); **this can only be done in-person.** Click on the SAS Student page for SAS program purchase information and online documents. The current cost is \$35.
- 2) SAS also has a free virtual app called SAS OnDemand for Academics. For more information and to get access, see https://www.sas.com/en_us/software/on-demand-for-academics.html. It can be used with any operating system.

Option 2 will work for all users and operating systems and has the additional benefit of being free. It does require a few extra steps of file upload/download because it is hosted on a remote server, but we have tutorial videos demonstrating these steps.

SAS Tutorials

There are tutorials provided in the online textbook for all skills needed for software assignments in this course. We have tried to make it as easy as possible to follow along with the tutorials. Watching the videos at a slower speed can help. Viewing the transcripts while you watch or work in SAS may also help. Whenever possible, many students find it helpful to have the videos playing in one window, monitor, or other device while working in the software in another, pausing as needed to work through the process with your own data.

Recommended SAS Books (optional – extra resources)

Although we will provide tutorials for all SAS skills required for this course, there are numerous guidebooks available if you wish to have additional resources. Many of these books are available both in print and online via the UF library.

The best for you may depend on what you might be doing with SAS after our course. Two options we recommend are

- The Little SAS Book: A Primer 5th ed., by Lora Delwiche and Susan Slaughter, SAS Institute: Cary, NC (2012). Available for free through the UF library
- Learning SAS by Example, by Ron Cody, SAS Institute: Cary, NC (2007). Available for free through the UF library

E-learning

An E-Learning site is available for the course (<http://elearning.ufl.edu>). **The weekly schedule and all course materials are available online through this site including grades, assignments, discussions boards, and other course information. It is very important to check the weekly page and review all announcements carefully.**

For technical support for this class unrelated to course content, please contact the UF Help Desk at:

- helpdesk@ufl.edu
- (352) 392-HELP - select option 2
- <https://helpdesk.ufl.edu/>

Additional Academic Resources

- [Career Connections Center](#): Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.
- [Library Support](#): Various ways to receive assistance with respect to using the libraries or finding resources.
- [Teaching Center](#): Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.
- [Writing Studio](#): 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.
- Student Complaints On-Campus: [Visit the Student Honor Code and Student Conduct Code webpage for more information.](#)
- On-Line Students Complaints: [View the Distance Learning Student Complaint Process](#)
- Enrollment Management Complaints (Registrar, Financial Aid, Admissions): [View the Student Complaint Procedure webpage for more information.](#)

ACADEMIC REQUIREMENTS AND GRADING

Assignments

Quizzes

There will be untimed, open-book quizzes in Canvas which are typically due each **Tuesday by 11:59 pm** covering the material assigned for the review of the previous week. You may take each quiz up to three times before the due date, and your highest score will count. Quizzes test basic definitions and skills and may sometimes be cumulative. We highly recommend that you start your first attempt early and take your three attempts on different days with time for reviewing the course material in between. When you submit a quiz attempt, you will see your grade and be able to review your quiz attempt.

Homework

Most assignments will involve data analysis in software and interpretation and/or certain questions which cannot be easily presented in the quizzes. Assignments will normally be due on **Thursdays at 11:59 pm on Canvas**, but all assignments except the first and last will require extended work and should be started as early as possible, no later than the week prior to the due date, to have time to address any questions or issues. For all **software assignments** in this course, if you do not receive full credit for the software part (Part A), you may resubmit Part A before the deadline for Part B to receive half credit back for your corrections.

Course Project

Each student will individually perform a guided data analysis based upon two (hopefully linearly related) quantitative variables. These variables will then be categorized in two ways (2 levels, 3+ levels). The relationship between the two variables will be investigated using different combinations of variable types. This course project will be completed in 4 steps during the semester, each of which will be submitted on Canvas.

Grading

Assignment type	Number	Percent of final grade
Quizzes	15	15%
Written homework	8	40%
Software homework	4	15%
Software for project	3	15%
Project final response	1	15%
Total		100%

Percentage Earned	Letter Grade	Grade Points
[93, 100]	A	4.0
[90, 93)	A-	3.67
[87, 90)	B+	3.33
[83, 87)	B	3.0
[80, 83)	B-	2.67
[77, 80)	C+	2.33
[73, 77)	C	2.0
[70, 73)	C-	1.67
[67, 70)	D+	1.33
[63, 67)	D	1.0
[60, 63)	D-	0.67
<60	E	0.0
-	WF	0.0
-	I	0.0
-	NG	0.0
-	S-U	0.0

Please be aware that a C- is not an acceptable grade for graduate students. The GPA for graduate students must be 3.0 based on 5000 level courses and above to graduate. A grade of C counts toward a graduate degree only if based on credits in courses numbered 5000 or higher that have been earned with a B+ or higher.

More information on UF grading policy may be found at: <https://gradcatalog.ufl.edu/graduate/regulations/#Grades>.

Exam Policy

There are no exams in this course.

Policy Related to Make Up Exams or Other Work

All work is expected to be submitted on Canvas by the specified due date and time. Late submissions will be accepted at a grade penalty of 10% of the maximum points available for each day late for up to 3 days after the initial due date unless arrangements have been made ahead of time with the instructor. Late submissions without penalty are available only due to illness or other unanticipated circumstances, consistent with College policy. Be prepared to provide documentation from a health care provider in such cases (e.g., a doctor's note or correspondence with the UF Computing help desk). You should email me within 24 hours of the original due date in these circumstances.

Policy Related to Required Class Attendance

Please note all faculty are bound by the UF policy for excused absences. For information regarding the UF attendance policies, see the Graduate Catalog (<https://gradcatalog.ufl.edu/graduate/regulations/#Attendance%20Policies>). I do not

take formal attendance, though attendance and participation are expected parts of the course. Please arrive on-time for class meetings to the extent possible.

STUDENT EXPECTATIONS, ROLES, AND OPPORTUNITIES FOR INPUT

Expectations Regarding Course Behavior

It's critical to review the weekly page in Canvas and read all announcements carefully. Each week's materials will be clearly identified on the course E-learning site. Students are expected to work through the material as scheduled. It is very important to work through all content contained on this site as directed and ask questions about the material you do not understand. Working through the content from start to finish is the best approach to achieve a high level of understanding and success in this course. In addition, it is your responsibility to review the comments and feedback we give on your graded assignments. Cell phones should not be used in class, and computers are only permissible for taking notes.

Communications Guidelines

Questions about course material should be asked during office hours or posted on the course discussion boards in E-Learning. Questions about specific quiz questions or issues of a personal nature should be sent by email through E-Learning. For questions asked Monday-Thursday, we will try our best to respond within 24 hours. For questions asked Friday-Sunday, we will respond by Monday or as soon as possible thereafter. Additionally, please review the UF guidelines for online communications: <https://teach.ufl.edu/wp-content/uploads/2020/04/NetiquetteGuideforOnlineCourses.docx>

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 Handbook for additional details:

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

<https://graduateschool.ufl.edu/work/handbook/>

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

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.

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:

<https://phhp.ufl.edu/policy-classroom-guests-of-students/>

Online Faculty Course Evaluation Process

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

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.

- U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.
- Counseling and Wellness Center: [Visit the Counseling and Wellness Center website](#) or call 352-392-1575 for information on crisis services as well as non-crisis services.
- Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the [Student Health Care Center website](#).
- 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](#).

- GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the [GatorWell website](#) or call 352-2734450.

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."
