

University of Florida
College of Public Health and Health Professions
PHC 4094 – Introduction to Biostatistics for Health Science and Public Health (3 credits)
Fall 2021
Delivery Format: Blended

Classroom: HPNP G114
Time: Monday 5th Period (11:45-12:35), Wednesday 5th & 6th Periods (11:45 – 1:40)

Instructor: Robert Parker, PhD
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College of Medicine

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Course Overview: This 3-credit course provides an introduction to some concepts and methods of biostatistical data analysis that are widely used in health sciences and public health. The topics include analysis of variance to compare three or more population means, correlation, simple linear regression, multiple linear regression, nonparametric and distribution-free statistical methods, and some basic concepts about survival analysis. Public health examples are used for demonstration. Students will practice preparing and interpreting data analysis reports.

Course Structure: The course will use a flipped/online structure, with students asked to view the week's instructional videos and/or readings prior to attending class on Monday. Weekly quizzes due by 11:30 AM on Wednesday will be used to assess comprehension of the week's material. Monday in class we will have time to review and ask questions about the course materials during class. Wednesday in class, we will participate in weekly activities with group-based work or class-discussion. Students will be asked to complete handouts provided for each activity. These handouts must be turned in within one week and will be graded in place of traditional homework assignments.

Course Objectives: It is expected that by the end of this course students will be able to:

1. Discuss the purpose and role of Biostatistics in the field of Public Health
2. Understand the process of consulting/collaborating with a biostatistician to design and analyze a study
3. Appraise data sources and data quality when selecting appropriate data for research questions
4. Describe the different types of data typically found in Public Health and clinical studies

5. Develop judgment about which statistical technique to use in a given situation
6. Interpret results from an ANOVA test in a public health context
7. Interpret coefficients from single and multiple linear regression computer output and characterize them in a public health context
8. Conduct hypothesis tests on 2x2 tables using Chi-squared or Fisher's exact test methods
9. Understand how sensitivity and specificity of a diagnostic test impact how the test is used in the population
10. Characterize the limitations of parametric statistical methods as they are applied to specific research settings and recognize nonparametric alternatives
11. Identify settings in which survival analysis is the preferred analytical approach
12. When reading journal articles, identify potential errors and limitations in the analyses
13. Prepare clear oral or written summaries interpreting data in its public health context
14. Recognize the limitations of statistical testing (e.g. clinical vs. statistical significance, debate about p-values)

Course Materials: This course will use the Canvas CMS. For issues with technical difficulties please contact the instructor or Academic Technology at the following:

Email: learning-support@ufl.edu
Phone: (352)392-HELP – select option 2
Web: <https://ss.at.ufl.edu/help.shtml>

Course announcements will be made via Canvas. Students are responsible for being aware of any course announcement within 24 hours of it being posted.

Required Text: There is no required text for this class. Course readings will be available on Canvas.

Optional text: *Statistics: The Art and Science of Learning from Data* by Alan Agresti and Christine Franklin 3rd Edition, Pearson, 2013.

Course Requirements

Quizzes (Weekly, Online)

Students are asked to view required videos and/or readings prior to attending class on Monday. There will be weekly quizzes to assess your comprehension of concepts and knowledge of requisite information needed to be successful in this course. The quizzes are in the Canvas course site and are directly related to each week's required videos/readings. You will have 2 attempts to complete each quiz and the highest score will be recorded. Quizzes are due by 11:30 AM on Wednesday. These quizzes will help you evaluate your understanding of course content by providing you feedback on your performance.

Weekly Activities (Hands-On Activities and Discussions)

Each Wednesday in class, we will engage in a weekly activity. All students will be expected to view course content, come prepared, contribute during class activities, participate in team-based problem solving, and share in class discussions. Since research is most often done collaboratively, your interactions with peers will contribute to learning.

In place of homework, students must provide clean and complete copies of weekly activities handouts for assessment. Handouts are to be submitted online (Word document, PDF, scanned document). Assignments are due the following Wednesday at the start of class. Students may work together but are expected to individually prepare their handout. Complete, clean, correct, and on-time assignments will receive 5 points. Assignments that are messy, incorrect, or no more than one day late will receive 3 points. Assignments that are mostly incomplete or more than one day late will receive 0 points. The lowest grade from the semester will be dropped.

Exams (Midterm 10/6, Final – During Final Exam Week. Time TBD)

There will be two exams in this course. Exams will be closed book. Additional details on the exam will be provided closer to the time of each exam.

Data Analysis Project (Due 11/12)

You will prepare a linear regression data analysis using output from a standard statistical package. You will be asked to properly interpret the output in a public health context. Additional details on the data analysis project will be provided after we complete our in-class data analysis activity.

Grading

Point Distribution:

- Quizzes – 5%**
- Weekly Activities – 30%**
- Midterm Exam – 25%**
- Data Analysis Project – 15%**
- Final Exam – 25%**

Late Work: Late weekly activity assignments will be marked late 5 minutes after the start of class and will not be accepted more than 1 day late; late assignments will be deducted points. In general, late work will not be accepted unless arrangements have been made ahead of the due date with the instructor.

Grading Scale: The final grade will be computed on the basis of the following assessments:

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

Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	WF	I	NG	S-U
Grade Points	4.0	3.67	3.33	3.0	2.67	2.33	2.0	1.67	1.33	1.0	0.67	0.0	0.0	0.0	0.0	0.0

Academic Integrity: Each student is bound by the academic honesty guidelines of the University that state: “The students of the University of Florida recognize that academic honesty and integrity are fundamental values of the university community. Students who enroll at the university commit to holding themselves and their peers to the high standard of honor required by the honor code. Any individual who becomes aware of a violation of the honor code is bound by honor to take

corrective action. The quality of a University of Florida education is dependent upon community acceptance and enforcement of the honor code." And, each student, upon submission of an assignment, implies the pledge:

"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.

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.php.ufl.edu/services/resourceguide/getstarted.htm>

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/>.

Online Synchronous Sessions:

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Professionalism and COVID

As students pursuing a path in the health professions or public health, it is crucial to demonstrate professional behaviors that reflect integrity and commitment to the health of patients, fellow health professionals, and to populations we serve. To accomplish this, a strong responsibility for the well-being of others must be evident in our decisions, along with accountability for our actions. Professionalism in the health disciplines requires adherence to high standards of conduct that begin long before graduation. This is particularly true during times of health emergencies such as the COVID pandemic, given our professional habits can have a direct impact upon the health of persons entrusted to us.

If you are not vaccinated, get vaccinated. Vaccines are readily available at no cost and have been demonstrated to be safe and effective against the COVID-19 virus. Visit this link for details on where to get your shot, including options that do not require an appointment:

<https://coronavirus.ufhealth.org/vaccinations/vaccine-availability/>. Students who receive the first dose of the vaccine somewhere off-campus and/or outside of Gainesville can still receive their second dose on campus.

In response to COVID-19, the following professional practices are in place to maintain your learning environment, to enhance the safety of our in-classroom interactions, and to protect the health and safety of ourselves, our patients, our neighbors, and our loved ones.

- You are required to wear approved face coverings at all times while in Health Science Center classrooms and within Health Science Center buildings even if you are vaccinated.
- If you are sick, stay home and self-quarantine. Please visit the UF Health Screen, Test & Protect website about next steps, retake the questionnaire and schedule your test for no sooner than 24 hours after your symptoms began. Please call your primary care provider if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 (or email covid@shcc.ufl.edu) to be evaluated for testing and to receive further instructions about returning to campus. UF Health Screen, Test & Protect offers guidance when you are sick, have been exposed to someone who has tested positive or have tested positive yourself. Visit the UF Health Screen, Test & Protect website for more information.
- Continue to follow healthy habits, including best practices like frequent hand washing.
- Avoid crowded places (including gatherings/parties with more than 10 people)

Sanitizing supplies are available in the classroom if you wish to wipe down your desks prior to sitting down and at the end of the class. Hand sanitizing stations will be located in every classroom.

Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work. If you are withheld from campus by the Department of Health through Screen, Test & Protect you are not permitted to use any on campus facilities. Students attempting to attend campus activities when withheld from campus will be referred to the Dean of Students Office.

Continue to regularly visit coronavirus.UFHealth.org and coronavirus.ufl.edu for up-to-date information about COVID-19 and vaccination.

COVID-19 Symptoms

See <https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html> for information about COVID-19 symptoms, which may include fever, cough, shortness of breath or difficulty

breathing, fatigue, chills, muscle or body aches, headache, sore throat, congestion or runny nose, nausea or vomiting, diarrhea, and loss of taste or smell.

Recording Class Sessions:

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.

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 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.

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 the 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>

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.

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

Tentative Course Schedule

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

	Dates	Weekly Topics and In-Class Activities
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WEEK 1	Aug 23	Introduction & Review
	Aug 25	<i>In-Class Activity:</i> Demographic data
WEEK 2	Aug 30	ANOVA
	Sept 1	<i>In-Class Activity:</i> ANOVA online tool
WEEK 3	Sept 6	Correlation (Holiday – No class)
	Sept 8	<i>In-Class Activity:</i> Guerrant <i>et al.</i> journal club
WEEK 4	Sept 13	Simple Linear Regression
	Sept 15	<i>In-Class Activity:</i> Least squares online tool
WEEK 5	Sept 20	Multiple Linear Regression
	Sept 22	<i>In-Class Activity:</i> Elias <i>et al.</i> journal club
WEEK 6	Sept 27	Additional Topics in Regression
	Sept 29	<i>In-Class Activity:</i> Regression data analysis
WEEK 7	Oct 4	Midterm Exam Review
	Oct 6	Midterm Exam
WEEK 8	Oct 11	Summaries of 2x2 Tables
	Oct 13	<i>In-Class Activity:</i> Clinical vs. statistical significance journal club
WEEK 9	Oct 18	Testing of 2x2 Tables
	Oct 20	<i>In-Class Activity:</i> Gardasil data
WEEK 10	Oct 25	Screening
	Oct 27	<i>In-Class Activity:</i> Prostate cancer screening
WEEK 11	Nov 1	Nonparametric Tests
	Nov 3	<i>In-Class Activity:</i> P-values journal club
WEEK 12	Nov 8	Statistical Traps to Avoid and Consulting
	Nov 10	Work on data analysis project, due 11/12 – No in class activity
WEEK 13	Nov 15	Nonparametric Tests (continued)
	Nov 17	<i>In-Class Activity:</i> Non-parametric testing
WEEK 14	Nov 22	Clinical Trials
	Nov 24	Thanksgiving
WEEK 15	Nov 29	Survival Analysis
	Dec 1	<i>In-Class Activity:</i> Goss <i>et al.</i> journal club
WEEK 16	Dec 6	Final Exam Review
	Dec 8	Final Exam Review
WEEK 17	Dec 13	Final Exam Week
	Dec 15	