University of Florida
College of Public Health & Health Professions Syllabus
Spring 2023 PHC 6053: Regression Methods for the Health and Life Sciences (3 credits)
Sections: MGH, MPD, OLOB – Delivery Format: Online
Course Specific Content and Assessments in E-Learning using CANVAS: http://elearning.ufl.edu/
Note: It is extremely important to review the home page in CANVAS each week and read all announcements carefully.

STARTING THE COURSE: Read this syllabus. Review the E-Learning home page and weekly schedule. Additional guidance for getting started is provided in the E-learning site in CANVAS.

INSTRUCTOR:	Dr. Robert Parker
Office:	CTRB 5219
Phone Number:	352-294-5906
Email Address:	rlp176@phhp.ufl.edu
Office Hours:	TBD via ZOOM in CANVAS or by appointment

PREFERRED COURSE COMMUNICATIONS:

- Ask about specific quiz questions or issues of a personal nature by email through CANVAS inbox in E-Learning
- Ask more general questions (NOT personal or specific quiz questions) on the discussion board

TEACHING ASSISTANT: TBD Email via E-Learning in Canvas INBOX

PREREQUISITE: PHC 6052: Introduction to Biostatistical Methods. Students must have prior experience with basic data entry and analysis in SAS. Students who have not taken the pre-requisite course must illustrate their SAS skills at the PHC 6052 level in order to obtain instructor approval to enroll. All students must have access to SAS 9.4.

See https://software.ufl.edu/student-agreements/ and click on "SAS Licensing Agreement" for SAS program purchase information and online documents. To purchase SAS you must be able to come to campus to obtain the software. Alternatively you can use SAS 9.4 on the UFApps system. See http://info.apps.ufl.edu/. You can also use SAS OnDemand for Academics, another free option provided by SAS. See https://www.sas.com/en_us/software/on-demand-for-academics.html.

Although most statistical analyses will be conducted using software in this course, **students should be comfortable working with equations and performing basic mathematical calculations including order of operations, fractions, square roots, logarithms (base *e*), and exponentials (e^x)**.

Note: in statistics the notation **log** is equivalent to the **natural logarithm ln**. This can be confusing as in algebra a log with no base assumed a base of 10. **In this course, a log with no base is assumed to be the natural logarithm, log = ln = $\log_e$.**

IMPORTANT: Course materials may discuss a few software packages. **In PHC 6053 you are only responsible for SAS.**

PURPOSE AND OUTCOME

COURSE OVERVIEW: This course introduces graduate students in fields other than statistics to a wide range of modern regression methods. Emphasis is on modeling driven by actual data from studies in a variety of areas, primarily from health, biology, and ecology. The primary topics are multiple linear regression, logistic regression, and Poisson regression. A main goal is to learn what approach to use among the linear and nonlinear models, and how to determine if the fit is adequate. By the end of the course, students will achieve competency in carrying out the analyses in SAS.

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

- CO-1: Select appropriate methods for a scenario; determine if a linear or a nonlinear approach is appropriate
- CO-2: Use statistical software for performing regression analysis in the SAS language
- CO-3: Test and interpret linear models for continuous outcome data (normal linear model)
- CO-4: Test and interpret models for categorical outcome data (logistic and Poisson regression)

- CO-5: Draw appropriate conclusions for both randomized designed experiments and observational studies
- CO-6: Communicate clearly to subject matter experts the purposes and results of complex statistical analysis, both orally and in writing.

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

- Describe the role of biostatistics in public health research.
- Interpret and critique analyses found in public health studies.
- Use appropriate statistical methodology to address public health problems.
- Develop presentations based on statistical methods and analyses for both public health professionals and educated lay audiences.
- Apply software to conduct statistical analyses.

INSTRUCTIONAL METHODS: This course is presented as an online course. Students will review online materials each week as directed on the E-Learning home page for this course. Students can receive feedback and assistance via the course discussion board or email in E-Learning. In this course, you will need to take responsibility for your own learning and request assistance from the instructor and other students as needed. The instructor can also provide advice and answer questions related to how each student can effectively and efficiently utilize the resources provided to their best advantage

DESCRIPTION OF COURSE CONTENT, COURSE MATERIALS, AND TECHNOLOGY

REQUIRED TEXTBOOK:

Vittinghoff, Glidden, Shiboski, and McCulloch (2012): Regression methods in Biostatistics 2nd edition, Springer. Book website: http: //www.biostat.ucsf.edu/vgsm. The textbook is available online through the UF library for free as a pdf. A PDF file will also be provided through the E-Learning site for this course. This textbook uses STATA. You can ignore any instruction in the textbook that is directly related to STATA.

OPTIONAL TEXTBOOKS:

Penn State has two courses with excellent sets of online materials:

- https://onlinecourses.science.psu.edu/stat462/
- https://onlinecourses.science.psu.edu/stat501/

The following are a few other applied regression textbooks which are freely available through the UF library system.

- Regression Methods for Medical Research (1)
  http://site.ebrary.com/lib/univflorida/detail.action?docID=10784792
- Wiley Handbooks in Applied Statistics : Handbook of Regression Analysis (1)
  http://site.ebrary.com/lib/univflorida/detail.action?adv.x=1&docID=10644016
- Wiley Series in Probability and Statistics : Regression Analysis by Example (5)
  http://site.ebrary.com/lib/univflorida/detail.action?adv.x=1&docID=11034369
- Regression Analysis : Statistical Modeling of a Response Variable (2)
  http://site.ebrary.com/lib/univflorida/detail.action?adv.x=1&docID=10382847
- Wiley Series in Probability and Statistics : Applied Linear Regression (4)
  http://site.ebrary.com/lib/univflorida/detail.action?adv.x=1&docID=10867127

ASSIGNED COURSE MATERIALS should be completed during the week assigned. Any questions you have regarding material presented should be clarified by posting on the course discussion board. YOU ARE RESPONSIBLE FOR ALL MATERIAL IN THESE ASSIGNMENTS. Take careful notes including both the specific details and the general concepts discussed.

LEARN BY DOING ACTIVITIES provide SAS code, SAS output, and ask you to review and answer specific questions. Review these activities carefully as they will provide insight into how to apply the concepts you are learning.

VIDEOS: Most videos created by the instructor will be stored in YouTube. If the text in the video is too blurry, try increasing the quality of the YouTube video using the small gear icon which appears at the bottom of the video when it is playing. If you want to view the video faster or slower, you can adjust the speed using the gear icon. Videos in this course may or may not have transcripts or captions.

RECOMMENDED SAS BOOKS:

- The Little SAS Book: A Primer 5th ed., by Lora Delwiche and Susan Slaughter - You can read for free via the UF library.
- Applied Statistics and the SAS Programming Language (2005), by Ron P. Cody and Jeffrey K. Smith. The best for you may depend on what you might be doing with SAS after our course.
- Many resources are available both in print and online via the UF Library.
- Your recommendations for others are also appreciated.

SAS INFORMATION: If you have questions about SAS ask on the discussion board. Do not allow yourself to waste time working in the software, if you are having issues, let us know immediately and we will help as soon as possible. Try to make sure as much of your time as possible in the software is productive. We offer some advice below and are happy to help you determine the best approach for you.

There is a document on the main SAS Resources page called SAS Skills Document for Material Covered in PHC 6052. This can be very useful for general SAS coding although it does not cover multiple regression topics. Sample SAS code will be provided for all skills required for this course. You can also look at the SAS code posted on the actual tutorial pages.

Some students find SAS to be the most fun part of the course, others dislike learning the software. Regardless, the MPH program (which operates this course) requires SAS to be an integral part of our instruction. If you find SAS to be fun and are willing to provide moral or tutorial support for other students, feel free to post on the discussion board or let me know!

E-LEARNING: An E-Learning site will be available for the course. **All course materials are available online through this site including grades, assignments, discussion boards, and other course information.** It is very important to check the home page of this site each week and review all announcements carefully. E-learning is accessible at http://elearning.ufl.edu/ or through my.ufl.edu. You must have a valid Gatorlink ID and password. For assistance, call the UF Help Desk at 392-HELP.

CHECK THIS LINK FOR NON-SAS TECHNICAL HELP: Information on many common issues can be found in our e-Learning Support pages at http://studentlife.online.mph.ufl.edu/

For **technical support for our E-learning in CANVAS site**, activities and assessments, please contact the Online Course Coordinator at:

Truly Hardemon, MEd
Room Number: HPNP 4173
Phone Number: 352-273-5822
Email Address: **hardemont@ufl.edu**
Office Hours: 8:00 am to 5:00 pm Monday - Friday

For **technical difficulties with E-learning in general** please contact the **UF Help Desk** at:

Learning-support@ufl.edu
(352) 392-HELP - select option 2

BROWSER RECOMMENDATIONS: https://kb.helpdesk.ufl.edu/FAQs/SupportedBrowsersForUFWebsites

RESPONSE TIME: If I can, I will address your questions immediately. During the week I will do my best to address all questions completely within 24 hours. Generally I will respond to questions as soon as possible each morning Monday-Thursday. For questions asked on Friday, Saturday, or Sunday, I may not be able to respond until early the following week.

ANNOUNCEMENTS: Class Announcements will be sent via the Announcements tool in E-learning, depending on your CANVAS notification settings, you may or may not be notified through your UF email. **Be sure to read all announcements carefully**. **You are responsible for all information in these announcements.** As a student of the University of Florida, it is very important to check your UFL email address and course sites regularly. An easy way to access your UF email account is at https://webmail.ufl.edu/.

DISCUSSION BOARDS: Reviewing the discussion posts of other students and posting your own can be very helpful.

ACADEMIC REQUIREMENTS AND GRADING

Note: Although you can never be awarded negative points for an assignment, if you do not follow the directions given in this syllabus and in the actual assignment, additional points can be deducted even if the assignment is otherwise correct.

ASSIGNMENTS: Individual assignments will involve either data analysis in software or interpretations. Assignments will generally require extended work and should be started as early as possible in order to have time to address any questions or issues. Software assignments can be remediated. Assignments relating to interpretation of the results of software output cannot be remediated.

DISCUSSION: Within each module you will find a discussion board for your group (group size will depend on number of students enrolled in course). You will be required to make one post per module according to the instructions posted within the discussion assignment, and to respond to at least one post from someone in your group per module according to the instructions posted within the discussion assignment. These discussions will be monitored and you will be graded based on your completion of the instructions and the quality of your posts.

FINAL PROJECT: There will be a final project consisting of student illustration of numerous skills covered in this course. The goal of the project is to conduct regression analyses using linear and logistic regression including exploratory data analysis, unadjusted estimates from simple regression models, and a final model.

ALL ASSIGNMENTS MUST BE SUBMITTED VIA E-LEARNING BY THE DUE DATE AND TIME

GRADING

Requirement	% of final grade
Software Assignments	25%
Interpretation Assignments	45%
Discussion Posts	15%
Final Project	15%

Point system used (i.e., how do final course averages translate into letter grades).

Final Average	94-100	90-93	85-89	80-84	77-79	74-76	70-73	67-69	64-66	60-63	57-59	Below 57
Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E

Please be aware that a C- is not an acceptable grade for graduate students. A grade of C counts toward a graduate degree only if an equal number of credits in courses numbered 5000 or higher have been earned with an A.

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

For greater detail on the meaning of letter grades and university policies related to them, see the Registrar's Grade Policy regulations at: http://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

GRADE RESPONSE TIMES: The time to receive your grade on assignments will vary depending on the type and length of the assignment. The instructor will always strive to return your graded work as soon as possible.

POLICY RELATED TO MAKE UP ASSIGNMENTS OR OTHER WORK: Students are allowed to make up work ONLY as the result of illness or other unanticipated circumstances warranting a medical excuse and resulting in the student missing an assignment deadline, consistent with College policy. Documentation from a health care provider is required. Work missed for any other reason will receive a grade of zero. 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 your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

ATTENDANCE POLICY: This is an online course. "Attendance" means you are expected to go through the course materials, take notes, pay attention to and post in the discussion boards. This is to be done at your own pace, but assignments and quizzes have scheduled deadlines to keep you on track. You are welcome to get ahead if you need flexibility in future weeks.

STUDENT EXPECTATIONS, ROLES, AND OPPORTUNITIES FOR INPUT

COMMUNICATION GUIDELINES: Questions about course material can be posted on course discussion boards in E-Learning. Questions about specific quiz questions or issues of a personal nature will be sent by email through E-Learning. Please review the Netiquette Guidelines:

http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf.

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/.

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/

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

ADVICE FROM DR. Parker

All I can ask is that you do the best you can with the materials that are made available to you and ask when you need more direction or explanation.

It is expected that you will spend approximately 10-12 hours each week on this course. Scheduling your time wisely and working efficiently will minimize the need for extra work in this course. Generally I advise students to break this time up into blocks of 1-3 hours split over as many days of the week as possible given your schedule. Working on too much material in one sitting is more likely to cause frustration and does not allow for time for understanding to develop or for questions to be answered.

Learn to use the materials to your greatest advantage. If you go through the content as directed, you will learn the skills you need to succeed in the course as well as build a foundation of statistical knowledge. If at times you feel lost, please ask but also understand that the course is building to a complete picture. Sometimes it is hard to see how each topic is related until later in the semester when we tie everything together.

Do not allow yourself to waste time working in the software, if you are having issues, let us know immediately and we will help as soon as possible. Try to make sure as much of your time as possible in the software is productive.

Be sure to ask when you don't understand and work hard to stay on-track with the material. Getting behind can be difficult to fix in any course. Let the instructor know as soon as possible if you feel you are falling behind.

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 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

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 please do not be afraid to ask for assistance.

Pacing Guide for Course Materials

For more details, see E-Learning. Due dates will be provided as early as possible.

Week	Monday	Topic
1	1/9	**Unit 1:** Exploratory Methods and Inference in Case CQ
2	1/16	**Unit 1:** Exploratory Methods and Inference in Case CQ
3	1/23	**Unit 2:** Inference in Case QQ – Simple Linear Regression
4	1/30	**Unit 2:** Inference in Case QQ – Simple Linear Regression
5	2/6	**Unit 3:** Multiple Linear Regression
6	2/13	**Unit 3:** Multiple Linear Regression
7	2/20	**Unit 3:** Multiple Linear Regression
8	2/27	**Unit 3:** Multiple Linear Regression
9	3/6	**Unit 4:** Inference in Case CC and QC – Contingency Tables and Simple Logistic Regression
10	3/20	**Unit 4:** Inference in Case CC and QC – Contingency Tables and Simple Logistic Regression
11	3/27	**Unit 5:** Multiple Logistic Regression
12	4/3	**Unit 5:** Multiple Logistic Regression
13	4/10	**Unit 6:** Model Selection
14	4/17	**Unit 6:** Model Selection
15	4/24	**Unit 7:** Poisson Regression and Generalized Linear Models
16	5/1	Final Exam Week