University of Florida
College of Public Health & Health Professions Syllabus
Spring 2016 PHC 6053: Regression Methods for the Health and Life Sciences (3 credits)
HPNP G103 Sections: 164D and 4958 – Monday 7th Period, Thursday 7th & 8th Periods
Delivery Format: Blended Learning Model
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.

☺   As an instructor, my primary goal is for each of you to learn as much as possible during the semester!   ☺

INSTRUCTOR:	Dr. Amy Cantrell (http://users.phhp.ufl.edu/acantrell/)
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Phone Number:	352-294-5927
Email Address:	acantrell@ufl.edu
Office Hours:	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
- Comment Anonymously through Qualtrix Survey (Password: spring.2016.reg)

Note: In the E-Learning system a cut-off time of 10:00pm means that at 10:00:01pm you are late. Computers are very literal and do not recognize seconds after a given time as "on time." Please plan your work accordingly and do not wait until this cut-off time to complete your assignments in the system.

TEACHING ASSISTANT:	Rachel Zahigian	Email via E-Learning in Canvas INBOX

- TA will mostly assist in grading and other course preparations. Questions should be directed to the instructor.

Prerequisites: PHC 6052 or equivalent and familiarity with SAS at the PHC 6052 level. 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.

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 = $\log_e$.**

We are using **SAS Version 9.3 (or higher)** in this course. The software is ONLY available for Windows. Becoming familiar with a statistical package is an important part of your statistical education. All students must have access to SAS 9.3 or higher for in class use. See https://software.ufl.edu/student-agreements/ and click on SAS Licensing Agreement for SAS program purchase information and online documents.

SAS 9.4 along with other applications such as Microsoft Office are available on the free APPS server (see http://info.apps.ufl.edu/). We do not provide support for using SAS via this server.

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

Other Potentially Useful Software:
- Open Office (http://www.openoffice.org/) - free "Office" suite of programs (like Microsoft Office)
- CutePDF (http://www.cutepdf.com/Products/CutePDF/writer.asp) – prints documents to PDF files
- Print Friendly (http://www.printfriendly.com/) is an excellent resource for printing webpages.

What is blended learning? A Blended Learning class uses a mixture of technology and face-to-face instruction. Blended learning typically involves multiple technologies such as E-Learning systems, online video, and web assignments for the communication of information. Some content that would have traditionally been presented during a live class lecture is instead provided online before the live class takes place.

Although we will still have some in-class lectures, as much time during class sessions as possible is devoted to time for students to ask questions of the instructor and work with each other to create solutions to assignments. Students can also receive feedback and assistance via the course discussion board or email in E-Learning.

What is expected of me? 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 the live class sessions. You are expected to actively participate in the live class. It is encouraged that you develop a time-management plan allotting yourself blocks of time throughout the week for working on this course, altering it as needed during the semester to best fit your learning preferences and schedule.

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.

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.

DESCRIPTION OF COURSE CONTENT, COURSE MATERIALS, AND TECHNOLOGY

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. A PDF file will also be provided through the E-Learning site for this course. This textbook uses STATA. You should review output given as it relates to the topic discussed but also review appropriate SAS output as provided. You can ignore any instruction in the textbook that is directly related to STATA.

Assigned readings should be completed during the week assigned. Any questions you have regarding material presented should be clarified by asking in class or posting on the course discussion board. YOU ARE RESPONSIBLE FOR ALL MATERIAL IN THESE ASSINGMENTS. Take careful notes including both the specific details and the general concepts discussed. Suggested problems are also given which, at a minimum, you should read and contemplate the ideas and potential solutions. Working the questions fully is optional.

Videos: Any videos provided 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 easy 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. The Weekly Schedule and all course information will be available online through this site including grades, assignments, discussion boards, and other information. E-learning is accessible at lss.at.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.

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://wiki.helpdesk.ufl.edu/FAQs/SupportedBrowsersForUFWebsites#elearning

Non-SAS Technical Help: On the sign-in site for E-Learning, http://elearning.ufl.edu/, there are multiple tutorials and help to aid students in navigating through the system. If you need help logging onto E-Learning, password issues, etc., please contact the UF Help Desk at 352-392-HELP(4357) or helpdesk@ufl.edu. If you need (non-SAS related) technical help in the course, please post your questions on the discussion board. You may find the answer to your issue from other student postings. This can often be the quickest way to get help.

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. I have class on Monday, Tuesday, and Wednesday afternoons during which I will be unavailable. 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 asking 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.

Quizzes: There will be untimed quizzes covering the textbook reading material assigned for review up to the previous week. The schedule is not set but you will be given at least 7 days notice of any due dates in this course. You have the opportunity to take each quiz up to three times before the due date. **In order to receive any credit for the quiz you must score 80% or higher.** Students who do not pass the quiz with a grade of 80% or higher will be required to remediate until they earn an 80% in order to obtain a grade for the quiz. The only score which can be earned through remediation is 80%. Students in need of remediation will be contacted directly by the instructor with instructions.

Quizzes test basic definitions and skills and may sometimes be cumulative in that they will go back and ask earlier questions. We highly encourage you to take your three attempts on different days with time for review in between. You will receive your score after each attempt and be allowed to review your attempts. There is feedback available in the quiz review which can help direct you to the content needed to review for questions you answered incorrectly. Many questions are randomly selected from pools of similar questions. Questions for each attempt will vary.

Assignments: Individual assignments will involve data analysis in software and interpretations as well as possibly certain types of questions which cannot be easily presented in the quizzes. The schedule is not set but you will be given at least 7 days notice of any due dates in this course. Assignments will require extended work and should be started as early as possible in order to have time to address any questions or issues.

Attendance: Attendance will be taken during each class session. Students who are on-time to class will receive 3 points; students who are less than 10 minutes late will receive 2 points; and students who are more than 10 minutes late will receive 1 point. Students who are not in attendance will receive 0 points.

Class Sessions: Any class time available beyond lectures can generally be used in whatever way each student finds most beneficial including working on assignments, quizzes, reviewing course materials and tutorials. **If you wish to review any videos in class please bring headphones or ear-buds as audio cannot be played aloud during class.** Use this time to try to address all important questions so that outside of class you will be able to make efficient use of your time.

Note: All assignments must be submitted via E-Learning by the exact due date and time

Grading

Requirement	% of final grade
Quizzes	45%
Assignments	45%
Required Attendance	10%

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 and TAs will always strive to return your graded work as soon as possible.

Policy Related to Make up Exams 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.

Policy Related to Required Class Attendance: Class attendance is mandatory. Excused absences follow the criteria of the UF Graduate Catalogue (e.g., illness, serious family emergency, military obligations, religious holidays), and should be communicated to the instructor prior to the missed class day when possible. UF rules require attendance during the first two course sessions. Regardless of attendance, students are responsible for all material presented in class and meeting the scheduled due dates for class assignments. Finally, students should review the currently assigned materials prior to the class meetings, and be prepared to discuss the material. 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: http://www.registrar.ufl.edu/catalogarchive/01-02-catalog/academic_regulations/academic_regulations_013_.htm

Communication Guidelines: Questions about course material should be posted on course discussion boards in E-Learning. Questions about specific quiz questions or issues of a personal nature should be sent by email INBOX 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 feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. I value your comments and honest review of this course and consistently work to improve the course based upon the results of these evaluations and other methods of feedback. Course evaluations are also an important part of the faculty promotion process. Evaluations are typically open during the last two or three weeks of the semester, but you will be notified of specific times when the evaluations are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/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.

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 8 hours each week on this course outside of class. 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 do not be afraid to ask for assistance.

Outline of Schedule for Course Materials
For more details, see the weekly schedule in E-Learning
Due Dates will be provided as early as possible.
Additional Readings along with suggested problems may be added in E-learning.

Week	Monday	Wednesday	Topic	Reading Assigned
1		1/6	**Topic 1:** Exploratory and Descriptive Methods	Prefaces, Review Contents, Chapter 1, Chapter 2, Section 3.1
2	1/11	1/13	**Topic 1:** Exploratory and Descriptive Methods	Sections 3.2-3.3
3	1/18 **No Class**	1/20	**Topic 2:** Simple Linear Regression	Sections 4.1-4.3
4	1/25	1/27	**Topic 2:** Simple Linear Regression **Topic 3:** Multiple Linear Regression I: Some Basics	Sections 4.4-4.5
5	2/1	2/3	**Topic 3:** Multiple Linear Regression I: Some Basics	Section 4.6
6	2/8	2/10	**Topic 4:** Multiple Linear Regression II: Confounding, Mediation and Interaction	
7	2/15	2/17	**Topic 4:** Multiple Linear Regression II: Confounding, Mediation and Interaction	Sections 4.7 and 4.9
8	2/22	2/24	**Topic 5:** Building the Regression Model: Model Validation	Chapter 10
9	2/29 **No Class**	3/2 **No Class**	**Spring Break – No Classes**	
10	3/7	3/9	**Topic 5:** Building the Regression Model: Model Selection	Sections 3.4 and 5.1
11	3/14	3/16	**Topic 6:** Logistic Regression I: Contingency Tables and Simple Logistic Regression	Section 5.2
12	3/21	3/23	**Topic 6:** Logistic Regression I: Contingency Tables and Simple Logistic Regression	
13	3/28	3/30	**Topic 7:** Logistic Regression II: Multiple Logistic Regression	Section 5.4
14	4/4	4/6	**Topic 7:** Logistic Regression II: Multiple Logistic Regression	
15	4/11	4/13	**Topic 8:** Logistic Regression III: Diagnostics and Model Selection	Sections 8.1, 8.3, and 8.5
16	4/18	4/20	**Topic 9:** GLM and Poisson Regression	
Finals Week	4/27-5/1 **No Classes**			

Note: The textbook is a good overview of many other methods not covered in this course. We also skip a few details in the topics covered. I highly encourage you to review other chapters and unassigned sections if you plan to implement regression models in your work.