Instructor Information:
Amy Cantrell, PhD     Email: via E-learning for course related emails
Clinical Assistant Professor     Phone: 352-294-5927
UF Department of Biostatistics     Office: CTRB 5213
Office Hours: by appointment     Web: http://users.phhp.ufl.edu/acantrell/

Prerequisites: PHC 6053: Regression Methods for the Health and Life Sciences (or equivalent). Students must also have access to a laptop for in-class use. Other computing requirements can be found at http://mph.ufl.edu/students/computer-requirements/.

Course Overview: This is a one credit course which covers using the statistical software R to process public health data. Students will learn how to input, store, modify, display, and analyze data using R. Students will develop basic R programming skills including working with vectors, lists, arrays, and matrices, writing functions and using R to simulate data.

Course Objectives: Upon completion of this course, students will
1. Use R to input store modify, display, and analyze public health data using R.
2. Develop user-defined functions in R.
3. Plan and implement simulations using R.
4. Plan and implement data analysis using R and present the results.

Course Materials: Our “Textbook” will consist of materials from the Comprehensive R Archive Network. These materials can be found at http://cran.r-project.org/manuals.html, however, direct links are also provided in E-learning along with other materials and links of interest.

E-Learning/Sakai: An E-Learning site in Sakai will be available for the course. Grades, discussion boards, and other course information will be available in the E-Learning system. E-learning is accessible at Iss.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

Course Requirements/Evaluation/Grading: Your grade in this course will be based on class participation, homework assignments, and a final presentation. The final course average earned will be based on the following:

□ Class Participation (25 %)   □ Homework (35%)   □ Presentation (40%)

• Class participation assessment will include attendance/tardiness, preparation for class, asking questions, and participation in discussions. (See details in the next section).

• Homework will consist of assignments which will require independent R programming to complete a specified task.

• Each student will give a final presentation on R code at the end of the semester. This assignment will ask students to work with their chosen dataset to illustrate certain programming skills and statistical analyses using R.

The grading scale for this course consists of the scale, including minus grades that follows. The conversion factors for grade point values assigned to each grade are also included (in parentheses):

Last revised January 4, 2014
Communication:

- Questions about course material should be posted on the course discussion boards in E-Learning.
- Questions of a personal nature (grades, etc.) should be sent via email or discussed in person.
- Note: When emailing the instructor using the E-learning mail tool, ALWAYS check the box “send a copy to the recipients email.” This will result in the fastest possible response.

Class Participation Grading:

- **Attendance (35% of Class Participation):** 0 = absent, 1-2 = late to class, 3 = present and on-time
- **Class Engagement (65% of Class Participation):**
  - Asking a question, answering a question, discussing a particular topic (either via the discussion boards or in-class) = 2 points each.
  - Presenting an example to the class (either in class or as a video) = 2-4 points, depending on degree of difficulty of the example.
  - Being clearly un-prepared for in-class work = 4 point deduction from class engagement total.
  - A maximum of 10 points each week can be earned – this is not to discourage you from continuing to be engaged but to prohibit your engagement from being crammed into a short period of time. Bonus points may occasionally be offered to students who continue to be engaged even though they have reached the maximum points for a given week.
  - Total points will be between 100 and 150 points depending upon the highest sum observed.
- **Each week (Due Thursday at 9 PM for the previous week from Tuesday to Monday), students will submit a report** on their self-assessment of class engagement and attendance. The instructor will verify and provide a final grade.

Schedule: The schedule is provided at the end of this document. Adjustments to this schedule are possible during the semester. The instructor will strive to be informative and fair regarding any changes.

Reading Assignments: The reading assignments should be completed prior to class during the week assigned in the schedule. Understanding of the sections listed is very important to becoming comfortable with R. Any questions you have regarding the material presented in the text should be clarified by either asking your question in class or posting your question on the course discussion board. **You should investigate the code presented in the textbook and other reading assignments on your own by trying the code and using help to investigate further. **YOU ARE RESPONSIBLE FOR ALL MATERIAL IN THE READING ASSIGNMENTS.

Policy Related to 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 read the assigned readings prior to the class meetings, and be prepared to discuss the material.
Classroom etiquette: Please come to class on time and be prepared to stay until the time scheduled as the end of class. Pagers and cell phones should not be used in class. Avoid “side” conversations. Please consider that your conversation may interrupt the attention of someone seated near you. Generally, you should be speaking to the class as a whole or participating in group discussions as directed by the instructor. I welcome in-class questions. Your question will nearly always be one that other students also have.

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 a homework or project 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.

Topical Outline: Each session is designed to include one or more of the following
- Instruct students on concepts regarding programming using R. This usually involves discussing example R code and output.
- Allow students time to practice R programming.
- Student presentations regarding chosen data.

Topics: Specific topics covered in the course are listed below. EVERY assignment requires understanding and application of multiple topics.

- Introduction
  - What is R?
  - Installing R
  - The R Environment and R Console
- R Basics
  - Creating and using vectors
  - Types of vectors in R
  - Generating regular sequences
  - Index vectors; selecting and modifying subsets of a vector
  - Objects, their modes and attributes
  - Factors in R
  - Arrays, matrices, lists, and data frames
  - tapply, functions, plots, and regression
  - Sink and pdf to output text and graphics
- Working with Data
  - Using datasets available in R
  - Writing data to text file
  - Reading data from text files
  - Changing variable names in data frame
  - Accessing portions of a data frame
  - Using dim and length functions
  - Using rbind and cbind
  - Creating data frames
  - Using quantile and cut
  - Creating frequency and two-way tables
  - Attaching a data frame
- Probability Distributions and Programming Concepts
  - Probability distributions
  - Grouping, loops, conditional execution
  - Working Directory, Workspace, History
  - Help and Documentation
  - Using Scripts
- Models, Packages and Graphics
  - Specifying statistical models in R
  - Displaying additional model information
  - Basic logistic regression in R
  - Loading and using the survival package
  - Uses of plot
  - Other plotting commands
  - Loading and using scatterplot3d package
  - Changing graphical parameters
  - Adding legends and text to plots
  - Adding points or lines to plots
  - Modifying plot axes
  - Multi-figure environment

Course and Instructor Evaluation Process: Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. These evaluations are conducted online at https://evaluations.ufl.edu. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.
**Statement of University’s Honesty Policy:** At the University of Florida, each student is bound by the academic honesty guidelines of the University and the student conduct code printed in the Student Guide and on the University website. The Honor Code states: “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.” Cheating, lying, misrepresentation, or plagiarism in any form is unacceptable and inexcusable behavior. Students are expected to act in accordance with the University of Florida policy on academic integrity (see Student Conduct Code, the Graduate Student Handbook or this web site for more details: [http://www.dso.ufl.edu/sccr/](http://www.dso.ufl.edu/sccr/)).

**My personal expectations and comments regarding academic integrity:** Students will often be encouraged to discuss the material with other members of the class on homework and other assignments. I believe we learn best when individual learning and group cooperation are present. However, I expect that no student will ever do any of the following:

- Have another person complete any assignment in this course
- Copy another student’s work on any assignment in this course
- Use materials provided by a previous student in the course for any purpose. Do not seek to obtain or accept offers of such materials (delete any materials you obtained prior to the beginning of the course)

I want to stress that in this class, if you focus on learning the material and worry less about the grade you will receive, you will be rewarded with knowledge that will be much more useful to you in the future than the grade received in this class.

**Accommodations for Students with Disabilities:** If you require classroom accommodation because of a disability, you must first register with the Dean of Students Office ([http://www.dso.ufl.edu/](http://www.dso.ufl.edu/)). 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 may occasionally have personal issues that arise in the course of pursuing higher education or that may interfere with their academic performance. If you find yourself facing problems affecting your coursework, you are encouraged to talk with an instructor and to seek confidential assistance at the University of Florida Counseling Center, 352-392-1575 or visit their web site for more information: [http://www.counseling.ufl.edu/cwc/](http://www.counseling.ufl.edu/cwc/).

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, including primary care, women's health care, immunizations, mental health care, and pharmacy 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: [http://shcc.ufl.edu/](http://shcc.ufl.edu/)

Crisis intervention is always available 24/7 from Alachua County Crisis Center: (352) 264-6789.

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.*
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Activity</th>
<th>Major Topics</th>
<th>Assignments Due</th>
<th>Reading Assignment Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7-Jan</td>
<td>Discussion</td>
<td>Syllabus; R Basics</td>
<td>None</td>
<td>No reading assignment</td>
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<tr>
<td>2</td>
<td>14-Jan</td>
<td>Practice</td>
<td>R Basics</td>
<td>Install R, Homework 1</td>
<td>Syllabus; Sections 1.1-1.4, 1.7-1.11, Chapters 2-4 (approx 17 pages from textbook), and 01_Introduction.R</td>
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<td>3</td>
<td>21-Jan</td>
<td>Practice</td>
<td></td>
<td></td>
<td>No Class Session</td>
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<td>4</td>
<td>28-Jan</td>
<td>Discussion</td>
<td>Working with Data</td>
<td>Homework 2</td>
<td>Sections 5.1, 5.8-5.10, Chapters 6-7 (approx 13 pages), and 02_WorkingwithData.R</td>
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<td>5</td>
<td>4-Feb</td>
<td>Practice</td>
<td>Working with Data</td>
<td></td>
<td>Section 8.1, Chapter 9, Sections 10.1, 10.3-10.5, 10.8, 10.9 (approx 10 pages)</td>
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<td>6</td>
<td>11-Feb</td>
<td>Discussion</td>
<td>Distributions and Programing Skills</td>
<td></td>
<td>Sections 11.1-11.3, 12.1-12.4 (approx 13 pages) and 03_DistributionsandProgramming.R</td>
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<td>7</td>
<td>18-Feb</td>
<td>Practice</td>
<td>Distributions and Programing Skills</td>
<td></td>
<td>Sections 12.5-12.6, Chapter 13 (approx 10 pages)</td>
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<td>8</td>
<td>25-Feb</td>
<td>Practice</td>
<td>Distributions and Programing Skills</td>
<td>Homework 3</td>
<td>No reading assignment</td>
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<td>9</td>
<td>4-Mar</td>
<td>Spring Break</td>
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<td>No Class Session</td>
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<td>11</td>
<td>18-Mar</td>
<td>Practice</td>
<td>Models, Packages, &amp; Graphics</td>
<td></td>
<td>Review Chapters 8-13</td>
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<td>12</td>
<td>25-Mar</td>
<td>Practice</td>
<td>Models, Packages, &amp; Graphics</td>
<td>Homework 4</td>
<td>Review Chapters 1-13</td>
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<td>13</td>
<td>1-Apr</td>
<td>Practice</td>
<td></td>
<td></td>
<td>No Class Session</td>
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<td>14</td>
<td>8-Apr</td>
<td>Deliver Presentations</td>
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<td>Student Presentations</td>
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<td>15</td>
<td>15-Apr</td>
<td>Deliver Presentations</td>
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<td>16</td>
<td>22-Apr</td>
<td>Deliver Presentations</td>
<td></td>
<td>Homework 5</td>
<td>No reading assignment</td>
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