University of Florida  
College of Public Health & Health Professions Syllabus  
PHC 6937: Analysis of Multivariate Data (3 credit hours)  
Fall: 2020  
Delivery Format: Online  

Instructor Name: Subha Guha, Ph.D.  
Office Number: Remote  
Phone Number: 352-294-5921 (office)  
Email Address: s.guha@ufl.edu  
Office Hours: Friday 11:30 a.m. – 1:30 p.m., or by appointment  
Preferred Course Communications: email  

Prerequisites: PHC 6092, PHC 6050C, and PHC 6051. Permission of the instructor is needed if this requirement is not met.  

PURPOSE AND OUTCOME  

Course Overview  
This course covers linear models methodology including simple and multiple regression and analysis of variance including factorial and block designs. The course covers regression for categorical data, random effects models for correlated data, and nonparametric and semiparametric regression.  

Course Objectives and/or Goals  
Upon successful completion of the course, students will be able to:  
- Understand the fundamental concepts of multivariate statistical theory  
- Apply the concepts to their own methodological and collaborative research  

Instructional Methods  
Lectures with slides, demonstrations in R, and online whiteboard. Homework assignments and two exams.  

Course Materials and Technology  

This course will use Canvas, and eLearning website that can be accessed at http://elearning.ufl.edu to organize and disseminate information. Students must be able to run the statistical package R, which is freely available at http://cran.r-project.org/.  

For technical support for this class, please contact the UF Help Desk at:  
- Learning-support@ufl.edu  
- (352) 392-HELP - select option 2  
- https://lss.at.ufl.edu/help.shtml
DESCRIPTION OF COURSE CONTENT

Topical Outline/Course Schedule
Adjustments to this schedule may be made during the semester

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>08/31</td>
<td>Aspects of Multivariate Analysis</td>
</tr>
<tr>
<td></td>
<td>09/02</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>09/07</td>
<td>No class</td>
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<tr>
<td></td>
<td>09/09</td>
<td>Aspects of Multivariate Analysis</td>
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<tr>
<td>3</td>
<td>09/14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>09/16</td>
<td>Matrix algebra and random vectors</td>
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<tr>
<td>4</td>
<td>09/21</td>
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<tr>
<td></td>
<td>09/23</td>
<td></td>
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<tr>
<td>5</td>
<td>09/28</td>
<td>Sample geometry and random sampling</td>
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<tr>
<td></td>
<td>09/30</td>
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<tr>
<td>6</td>
<td>10/05</td>
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<tr>
<td></td>
<td>10/07</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>10/12</td>
<td>The multivariate normal distribution</td>
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<tr>
<td></td>
<td>10/14</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>10/19</td>
<td>Review</td>
</tr>
<tr>
<td></td>
<td>10/21</td>
<td>Exam 1</td>
</tr>
<tr>
<td>9</td>
<td>10/26</td>
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<td></td>
<td>10/28</td>
<td>Inferences about a mean vector</td>
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<tr>
<td>10</td>
<td>11/02</td>
<td></td>
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<tr>
<td></td>
<td>11/04</td>
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<tr>
<td>11</td>
<td>11/09</td>
<td>Comparisons of several multivariate means</td>
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<tr>
<td></td>
<td>11/11</td>
<td>No class</td>
</tr>
<tr>
<td>12</td>
<td>11/16</td>
<td>Comparisons of several multivariate means</td>
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<tr>
<td>13</td>
<td>11/18</td>
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<tr>
<td></td>
<td>11/23</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>11/25</td>
<td>No class</td>
</tr>
<tr>
<td></td>
<td>11/30</td>
<td>Multivariate linear regression models</td>
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<tr>
<td></td>
<td>12/02</td>
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<tr>
<td>15</td>
<td>12/07</td>
<td>Review</td>
</tr>
<tr>
<td></td>
<td>12/09</td>
<td>Exam 2</td>
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</table>

ACADEMIC REQUIREMENTS AND GRADING

Assignments
The overall grade will include homework discussion and two exams. Students are encouraged to discuss in groups or with the instructor on homework assignments, but are expected to complete homework on their own.

All homework must be typed in Word or Latex (12 point font size, double-spaced, 1-inch margin). Unless otherwise specified, all assignments should be turned in via the Canvas assignment tab by 5 p.m. of the due date.

Homework: 30%
Exam 1: 25%
Exam 2: 35%

The instructor reserves the right to revise the above distribution if necessary.
The grading scale for this course consists of the standard scale, including minus grades, below. Percentages will be rounded up when computing the grade.

93% - 100% = A
90% - 92% = A-
87% - 89% = B+
83% - 86% = B
80% - 82% = B-
77% - 79% = C+
73% - 76% = C
70% - 72% = C-
67% - 69% = D+
63% - 66% = D
60% - 62% = D-
Below 60% = E

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.

Letter grade to grade point conversions fixed by UF:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>A</th>
<th>A-</th>
<th>B+</th>
<th>B</th>
<th>B-</th>
<th>C+</th>
<th>C</th>
<th>C-</th>
<th>D+</th>
<th>D</th>
<th>D-</th>
<th>E</th>
<th>WF</th>
<th>I</th>
<th>NG</th>
<th>S-U</th>
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<tbody>
<tr>
<td>Grade Points</td>
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<td>3.67</td>
<td>3.33</td>
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<td>1.67</td>
<td>1.33</td>
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<td>0.67</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

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

Exam Policy
Students may not share exams or exam solutions with anyone else at any time, even after the course is finished.

Policy Related to Make up Exams or Other Work
In the event of unusual circumstances, a student could be given a make-up exam, or an incomplete grade in the course. The instructor must be notified by email about a request for a make-up exam as soon as possible.

Homework assignments must be submitted by 5 p.m. of the due date. Late assignments will not be accepted after the due date without an official excused absence.

Please note: Any requests for make-ups due to technical issues MUST be accompanied by the UF Computing help desk (http://helpdesk.ufl.edu/) correspondence. You MUST e-mail me within 24 hours of the technical difficulty if you wish to request a make-up.

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 Policy see the Registrar website for additional details: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Excused absences must be consistent with university policies in the Graduate Catalog (http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#attendance). Additional information can be found here: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx
STUDENT EXPECTATIONS, ROLES, AND OPPORTUNITIES FOR INPUT

Expectations Regarding Course Behavior
All students are expected to remain actively engaged in lecture material and participate in class discussions. Out of respect for your peers, cell phones and off-topic use of laptops will not be tolerated. Not only will these distractions interfere with the student’s ability to learn, but they will also interfere with the learning of their classmates.

Communications Guidelines
When communicating with classmates or the instructor, especially when using email messages or Canvas discussions, please be courteous and respectful to avoid hindering the learning community established by the course. For information on netiquette guidelines, go to http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf

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/
http://gradschool.ufl.edu/students/introduction.html
Please remember cheating, lying, misrepresentation, or plagiarism in any form is unacceptable and inexcusable behavior.

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 video or profile 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.
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](http://www.dso.ufl.edu) within the first week of class. 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 make sure you provide this letter to me by the end of the second week of the course. 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](http://www.counseling.ufl.edu). On line and in person assistance is available.
- You Matter We Care website: [http://www.umatter.ufl.edu](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/](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](http://www.alachuacounty.us/DEPTS/CSS/CRISISCENTER/Pages/CrisisCenter.aspx)

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](http://www.multicultural.ufl.edu)