

PHC6052 Introduction to Biostatistical Methods (3 credit hours)

Summer A: 2020

Delivery Format: Online

Open Access Course Materials: <http://bolt.mph.ufl.edu/>

Course Specific Content and Assessments in E-Learning: <http://elearning.ufl.edu/>

STARTING THIS COURSE: Read this syllabus. You must take the “Syllabus Quiz” (Quiz 0) in CANVAS and earn a 100% in order to start the course. This quiz is located under Assignments. The quiz is based on the information contained in this syllabus and may be taken as many times as needed to earn a 100%. This quiz is required and will count toward your final grade.

Instructor Name: Dr. Yichao Yu
Room Number: CTRB 5213
Phone Number: 352-294-5927
Email Address: yyu2013@ufl.edu
Office Hours: **Online** Mondays 1-2pm, or by appointment (Zoom Meeting ID: **5899686197**)
Teaching Assistants: Xiulin Xie (xiulin.xie@ufl.edu) and Samuel Chijioke Anyaso-Samuel (sanyasosamuel@ufl.edu)
Preferred Course Communications:

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

Prerequisites

There is no specific prerequisite courses, but students should be comfortable working with equations and performing basic mathematical calculations including order of operations, fractions, and square roots.

Purpose and Outcome

Course Overview

This 3-credit course is a sophisticated introduction to the concepts and methods of biostatistical data analysis. The topics include descriptive statistics, probability, standard probability distributions, sampling distributions, point and confidence interval estimation, hypothesis testing, power and sample size estimation, one and two-sample parametric and non-parametric methods for analyzing continuous or discrete data, and simple linear regression. The SAS statistical software package will be used for data management and statistical analyses.

Relation to Program Outcomes

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

- Describe the role of biostatistics in public health research.
- Use appropriate statistical methodology to address public health problems.
- Apply software to conduct statistical analyses.

Course Objectives and/or Goals

Upon successful completion of this course, students will be able to

- CO-1: Describe the role biostatistics serves in the discipline of public health.
- CO-2: Differentiate among different sampling methods and discuss their strengths and limitations.
- CO-3: Describe the strengths and limitations of designed experiments and observational studies.
- CO-4: Distinguish among different measurement scales, choose the appropriate descriptive and inferential statistical methods based on these distinctions, and interpret the results.
- CO-5: Determine preferred methodological alternatives to commonly used statistical methods when assumptions are not met.
- CO-6: Apply basic concepts of probability, random variation, and commonly used statistical probability distributions.
- CO-7: Use statistical software to analyze public health data.
- CO-8: Develop presentations based on statistical analyses for both public health professionals and educated lay audiences.

Description of Course Content

Topical Outline

Week	Date(s)	Topic(s)
1	5/11-5/15	Preliminaries and Unit 1 – Exploratory Data Analysis
2	5/18-5/22	Unit 2 – Producing Data and Unit 3A – Probability
3	5/26-5/29	Unit 3B – Random Variables and Unit 3B – Sampling Distribution
4	6/1-6/5	Unit 4A – Introduction to Statistical Inference
5	6/8-6/12	Unit 4B – Inference for Relationships
6	6/15-6/19	Review and Course Project

Detailed schedule for course materials and due dates can be found in the end of the syllabus.

Course Materials and Technology

All course materials are available online either through **CANVAS** (<http://elearning.ufl.edu>) or in the **online open access textbook** (<http://bolt.mph.ufl.edu>). You will also need access to the statistical software package, SAS. There is no required textbook to purchase for this course. However, I recommend the following textbook for additional examples/exercises:

- Daniel, W.D. (2013): *Biostatistics: A Foundation for Analysis in the Health Sciences*. 10th Edition, Wiley.
- Agresti, A. (2013): *The Art and Science of Learning from Data*. 4th Edition, Pearson.

IMPORTANT: Course materials discuss a few software packages. **In PHC 6052 you are only responsible for SAS.**

Statistical Software – SAS

We are using SAS Version 9.3 (or higher) in this course. See the **SAS information sheet** for specific instructions. There are two ways of SAS Licensing for students at UF. You can also obtain this software from other resources.

- **Direct student leasing** is available for use on personally-owned computer. **SAS is only available for Windows as a direct installation.** SAS can be purchased **ON CAMPUS** at the UF Computing Help Desk located at the 132 HUB Stadium Road which should be the one mentioned here: <https://software.ufl.edu/software-listings/sas-student-licensing.html> (or search for “SAS Student Licensing” at <https://software.ufl.edu/>). Due

to COVID-19, their service time maybe changed. Please contact with UF Computing Help Desk at (352)392-HELP (4357) for more information.

- SAS is also available on **UFApps for students**, <https://info.apps.ufl.edu>. Besides SAS, this free Apps server also provide various other applications such as Microsoft Office. This works for any computing device from any location at any time, as long as you log in with your GatorLink Credentials. This may be the best option for MAC users. Many students have been successful at using this system for their assignments in this course. To use SAS on UFApps, you will need to learn additional skills regarding how the apps server works with files and how to get information back and forth between your computer and the UFApps server. I highly recommend storing your files on the M: drive (can also be found in UFApps) because it provides the best performance when working with apps on the server. You may find this information very useful: <https://info.apps.ufl.edu/frequently-asked-questions/first-time-use/>, <https://info.apps.ufl.edu/frequently-asked-questions/using-ufapps/>, and <https://info.apps.ufl.edu/frequently-asked-questions/using-ufapps/access-canvas-from-within-ufapps/>.
- SAS also have a virtual app called **SAS University Edition**. For more information and to download the needed software, see https://www.sas.com/en_us/software/university-edition.html. It can be used with Windows, OS X, and LINUX system.
- For some departments, SAS may also be available through their **unit IT group or remote desktop**. Check with your own department for SAS access.

SAS Tutorials

There are tutorials provided on online textbook for all skills needed for assignments in this course (<https://bolt.mph.ufl.edu/software/sas/phc-6052-sas-tutorials/>). We have tried to make it as easy as possible to follow along with the tutorials. Watching the videos at a slower speed can help. Viewing the transcripts while you watch or work in SAS may also help. Whenever possible, many students find it helpful to have the videos playing in one window, monitor, or other device while working in the software in another, pausing as needed to work through the process with your own data.

If you have questions about SAS, ask in the “SAS Questions” discussion board in CANVAS. **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.**

Recommended SAS Books (optional – extra resources)

The Little SAS Book: A Primer 5th ed., by Lora Delwiche and Susan Slaughter is available online via [UF library](#), or 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.

E-learning

An E-Learning site is available for the course (<http://elearning.ufl.edu>). **The weekly schedule and all course materials are available online through this site including grades, assignments, discussions boards, and other course information. It is very important to check the weekly page and review all announcements carefully.**

Announcements

Class announcements will be sent via the Announcements tool in E-Learning. You should have your CANVAS notification settings to send alerts to your UF email for announcements through CANVAS. You are responsible for all information in 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 <http://webmail.ufl.edu>.

Discussion Boards

Reviewing the discussion posts of other students in E-learning and posting your own can be very helpful.

Online open access textbook

Most of the course materials in E-learning are linked to online open access textbook (<http://bolt.mph.ufl.edu>).

Computing

Please review the Student Computing requirements appropriate for you found at <http://mph.ufl.edu/current-students/student-essentials/technology-requirements/>.

Videos

Most videos presented in the online open textbook are 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. Many videos have closed captions and/or transcripts available.

Flash

Embedded self-assessment quizzes and other components of the course materials require Flash. Be sure to enable Flash in your browser and update if needed (<http://www.adobe.com/software/flash/about/>). If the online textbook page shown as “not secure”, make sure to allow “insecure content”. Microsoft Edge is recommended.

For technical difficulties with E-learning and online textbook in general, please contact the UF Help Desk at:

- Learning-support@ufl.edu
- (352) 392-HELP - select option 2
- <https://lss.at.ufl.edu/help.shtml>

Academic Requirements and Grading

Quizzes

There will be untimed quizzes in CANVAS **due each Friday by 10pm** covering the material assigned for the review of the week. You have the opportunity to take each quiz up to three times before the due date. Your highest of these scores will be recorded.

Quizzes test basic definitions and skills and may sometimes be cumulative in that they will go back and ask earlier questions. We highly recommend that you start your first attempt early and take your three attempts on different days with time for reviewing the course material in between. When you submit a quiz attempt, you will see your grade and will be able to review your quiz attempt. For each question, you will see whether you answered correctly or incorrectly but it will not reveal the correct answer for any you did not answer correctly. There will also be feedback for each question which will direct you to the most important content to review.

Assignments

Most assignments will involve data analysis in software and interpretation and/or certain questions which cannot be easily presented in the quizzes. Assignments will be **due on Monday at 10pm** (except for Week 3 because of the Memorial Day holiday), but all assignments require extended work and should be started as early as possible, no later than the week prior to the due date, in order to have time to address any questions or issues.

For all **software assignments** in this course, if you are not receiving full score for software part (Part A) that submitted before its deadline, please check the comments and feedback from us and correct the corresponding mistakes. You still have chances to resubmit software part (Part A) before the deadline of written part (Part B). If the first submission of software part is after deadline of Part A but before deadline of Part B, software part will still be viewed but will received a grade of zero.

Course Project

Each student will be working on an individually course project consisting of a guided data analysis based upon two quantitative variables. These variables will then be categorized in two ways (2 levels, 3+ levels). The relationship between the two variables will be investigated using different combinations of variable types. The software output will be provided and student will complete the interpretation in the course project.

Grading

Requirement	% of final grade
Quizzes (7)	42%
Assignments (5)	40%
Software for Assignments (3)	5%
Course Project	13%

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

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

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.

More information on UF grading policy may be found at:

<http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#grades>

Policy Related to Make up Work

All work must be submitted via E-Learning by the exact due date and time. Any late submission or missed work will receive a grade of ZERO unless arrangements have been made ahead of the due date with the instructor. Late submission or make-ups is acceptable ONLY as a 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. Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from UFIT support when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail the instructor within 24 hours of the technical difficulty if you wish to request a make-up.

Policy Related to Required Class Attendance

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.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Student Expectations, Roles, and Opportunities for Input

Expectations Regarding Course Behavior

It is important to review the weekly page in CANVAS and read all announcements carefully. The materials for each week will be clearly identified in the E-Learning site for the course. Students are expected to work through the material as scheduled. It is very important to work through all content contained on course website as directed and ask questions about the material you do not understand. **Working through the content from start to finish is the best approach to achieve a high level of understanding and success in this course.** In addition, it is your responsibility to review the comments and feedback we give on your graded assignments.

The primary difference between the online and campus versions of this course is an attendance and group activity requirement. The group activities are based upon the **worksheets** which are always available from links in the Course Resources page and weekly modules on CANVAS. Although the worksheets are used for campus students, I highly urge you to go through the solutions and ask if you need further clarification.

Communication Guidelines

Questions about course material should be asked during office hours or posted on the course discussion boards in E-Learning. Questions about specific quiz questions or issues of a personal nature should be sent by email through E-Learning. For questions asked Monday-Thursday, we will try our best to respond within 24 hours. For questions asked Friday-Sunday, we will respond Monday or as soon as possible thereafter.

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/>.

ADVICE

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

Since this is a Summer A course where the regular 16-week materials have been condensed into 6 weeks, it is expected that you will spend approximately 20 hours per 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 3-5 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. There is a lot of content, but *if you understand the examples we present or if you have experience with certain topics, it may not be necessary to review all of the content we provide.*

The questions presented in the “Learn by Doing” and “Did I Get This” activities as well as the course worksheets are indicative of important questions and concepts that you will need to understand and are designed to teach as well as test your understanding. We highly encourage you to go through these as they are presented in the online textbook (for the “Learn by Doing” and “Did I Get This” activities) and on the weekly page or Course Resources page in E-Learning (for the worksheets).

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. Often in the “Learn by Doing” activities and worksheets we are leading you to think about things that will be important later in the course in addition to working on skills related to the current topic.

Watch the software tutorials carefully, especially if you find the software aspect challenging, and review our suggestions in the SAS information section earlier. 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

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as

possible in the semester. 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>

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.

PHC 6052 Online Summer A 2020 Schedule for Course Materials and Due Dates

Content to Review	Major Upcoming Activities and Assignments (See E-learning Weekly Page for More Details)	Monday	Friday
Week 1		5/11	5/15
Preliminaries Unit 1 – Exploratory Data Analysis	<ul style="list-style-type: none"> • Syllabus Quiz • Quiz #1 • Worksheet #1 – Variables • Assignment #1 <hr style="width: 50%; margin: 5px auto;"/> <p style="text-align: center;">DUE BY END OF THIS WEEK:</p> <ul style="list-style-type: none"> • SAS Working!!! 6052 = SAS 		<p style="text-align: center;">Due 10:00pm</p> <ul style="list-style-type: none"> • Syllabus Quiz (Quiz #0) • Quiz #1 – Preliminaries & Unit 1
Week 2		5/18	5/22
Unit 2 – Producing Data Unit 3A - Probability	<ul style="list-style-type: none"> • Assignment #1 • Quiz #2 • Worksheet #2 – Probability • Assignment #2 • Assignment #3 	<p style="text-align: center;">Due 10:00pm</p> <ul style="list-style-type: none"> • Assignment #1 Part A – EDA for One Variable (Software) 	<p style="text-align: center;">Due 10:00pm</p> <ul style="list-style-type: none"> • Quiz #2 – Producing Data & Probability
Week 3		5/26	5/29
Unit 3B – Random Variables Unit 3B – Sampling Distribution	<ul style="list-style-type: none"> • Assignment #1 • Assignment #2 • Assignment #3 • Quiz #3 • Worksheet #3 – Discrete RVs • Worksheet #4 – Continuous RVs 	<p style="text-align: center;">Due 10:00pm</p> <ul style="list-style-type: none"> • Assignment #1 Part B – EDA for One Variables (Written) • Assignment #2 Part A – Case CC and CQ (Software) • Assignment #3 – Independent Events 	<p style="text-align: center;">Due 10:00pm</p> <ul style="list-style-type: none"> • Quiz #3 – Random Variables & Sampling Distribution

University of Florida
College of Public Health & Health Professions Syllabus

Content to Review	Major Upcoming Activities and Assignments (See E-learning Home Page for More Details)	Monday	Friday
Week 4		6/1	6/5
Unit 4A – Introduction to Statistical Inference	<ul style="list-style-type: none"> • Assignment #2 • Assignment #4 • Quiz #4 • Worksheet #5 – Estimation • Worksheet #6– Hypothesis Testing 	Due 10:00pm <ul style="list-style-type: none"> • Assignment #2 Part B – Case CC and Case CQ (Written) • Assignment #4 Part A – EDA for Two Variables (Software) 	Due 10:00pm <ul style="list-style-type: none"> • Quiz #4 – Intro to Statistical Inference
Week 5		6/8	6/12
Unit 4B – Inference for Relationships	<ul style="list-style-type: none"> • Assignment #4 • Quiz #5 • Assignment #5 • Course Project • Bonus software assignment 	Due 10:00pm <ul style="list-style-type: none"> • Assignment #4 Part B – EDA for Two Variables (Written) 	Due 10:00pm <ul style="list-style-type: none"> • Quiz #5 – Inference for relationships
Week 6		6/15	6/19
Review and Course Project	<ul style="list-style-type: none"> • Assignment #5 • Course Project • Bonus software assignment • Quiz #6 	Due 10:00pm <ul style="list-style-type: none"> • Assignment #5 – Examples from Literature • Bonus: Paired T-test in Software 	Due 10:00pm <ul style="list-style-type: none"> • Quiz #6 – Comprehensive Quiz • Course Project