PHC6937: Data Visualization in the Health Science (3 credits)

Spring: 2020
Delivery Format: On Campus
Course Website: Canvas

Instructor Name: Steven Foti, PhD
Room Number: HPNP G-112
Meeting Times: Mondays 9:35am – 11:30am, Wednesdays 9:35am – 10:25am
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Office Hours: Tuesdays 1-3pm in CTRB 5227
Preferred Course Communications: email/Canvas inbox

Prerequisites

A course in statistics such as PHC 6052 or equivalent. Some familiarity with R statistical software is recommended but not required.

PURPOSE AND OUTCOME

Course Overview

The world is growing increasingly reliant on collecting and analyzing information to help people make decisions. Because of this, the ability to communicate effectively about data is an important component of future job prospects across nearly all disciplines. In this course, students will learn the foundations of information visualization and sharpen their skills in communicating using health science data. Throughout the semester, we will use R and other software to explore concepts in graphic design, storytelling, data wrangling and plotting, and biostatistics as they apply to data-driven communication. Whether you're an aspiring data scientist or you just want to learn new ways of presenting health science information, this course will help you build a strong foundation in how to talk to people about data.

Course Objectives and/or Goals

Upon completion of the course, students should be able to:
1) Construct sophisticated data displays that adequately express the meaning of their data.
2) Recommend the best types of data visualizations to use for a given type of data.
3) Critique/Evaluate/Assess the appropriateness of a data display.

Instructional Methods

This course will use lectures, discussions, and in-class activities (individual and group) to build an active learning environment. While teaching and learning technical skills are important for creating data displays, there is an art and science behind their use and effectiveness.

DESCRIPTION OF COURSE CONTENT

Course Schedule (subject to change with advanced notice)

Week	Date(s)	Topic(s)	Readings
1	1/6, 8	Introduction and R Background	
2	1/13, 15	Telling Stories with Data	TED Talk, VT Ch. 1
3	~~1/20~~, 22	Theory	
4	1/27, 29	Theory	VDQI
5	2/3, 5	Handling Data	VT Ch. 2, R4DS Ch. 5, 12
6	2/10, 12	Basic Plotting	VT Ch. 5, VT Ch. 6, R4DS Ch. 3
7	2/17, 19	Basic Plotting	
8	2/24, 26	Enhancing Plots for Publication	R4DS Ch. 28
9	3/2, 5	Displaying Data Over Time	VT Ch. 4
10	~~3/9, 11~~	(No Classes this week)	
11	3/16, 18	Displaying Data Over Time	
12	3/23, 25	Displaying Genetics Data	
13	3/30, 4/1	Displaying Spatial Data	VT Ch. 8
14	4/6, 8	Visuals for Modelling	VT Ch. 7
15	4/13, 15	Interactive Displays and Dashboards (IDD)	
16	4/20, 22	IDD/Final Project Presentations	

Strikethrough designates no class meeting on that date.

Course Materials and Technology
Students will need a laptop that they can bring to class and that can run R statistical software and R Studio (min. requirements). Installation of all required tools will be covered in the first week of class. Additionally, students will need access to the following textbooks:

1) Tufte, E. R. (2001). *The visual display of quantitative information* (Vol. 2). Cheshire, CT: Graphics press. ISBN-13: 978-1930824133 **(VDQI)**
2) Wickham, H., Grolemund, G. *R for Data Science*. https://r4ds.had.co.nz/ **(R4DS)**
3) Yau N. *Visualize This. [Electronic Resource] : The FlowingData Guide to Design, Visualization, and Statistics*. Wiley Pub.; 2011. Available through the UF Library. **(VT)**

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

ACADMIC REQUIREMENTS AND GRADING

Assignments
Classroom Participation (10%) – This course will involve individual/group activities and discussions that are to be completed in the classroom. Therefore, active, professional participation in these activities are a part of the final grade.

Homework (40%) – These assignments will involve practice exercises in coding/graphing, critiquing graphs, and/or responses to course readings.

Midterm Project (20%) – In small groups, students will use a provided data set to propose a solution to a problem. This project will involve creating visualizations of the data and delivering a short presentation to the class explaining your findings and proposed solution.

Final Project (30%) – Each student will find and use their own data source(s) to create a series of visualizations that reveal insights into their data. Students will then prepare a short presentation to provide the context of their data set, questions posed, and visualizations that communicate answers to those questions.

Point system used:

Points Earned	93-100	90-92	87-89	83-86	80-82	77-79	73-76	70-72	67-69	63-66	60-62	Below 60
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. 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
If you miss class or know you will be missing class, please let me know as soon as possible so that we can discuss a schedule for making up missed work. In general, if you know ahead of time that you will be missing class for an acceptable reason, it is preferred that you turn in the missed work ahead of time. Late work will receive a 0 if the due date arrives and you have not contacted me about requesting an extension.

Policy Related to Required Class Attendance
Since this course will include group work and in-class discussions, attendance is highly encouraged. More than one unexcused absence will result in 1% drop in classroom participation grade per absence. For more information on the UF attendance policy and definitions of excused absences, please see the UF Graduate Catalog.

STUDENT EXPECTATIONS, ROLES, AND OPPORTUNITIES FOR INPUT

Expectations Regarding Course Behavior
Students are expected to participate and engage in classroom discussions in a professional manner. The nature of these discussions will often have elements that depend on personal preference and further, due to the nature of statistics, may have more than one acceptable answer/solution. Therefore, students are expected to be considerate of others' responses that may not align with their own.

Communications Guidelines
Please follow general netiquette guidelines in all course communications with the instructor and fellow students.

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/.

Policy Related to Guests Attending Class
Only registered students are permitted to attend class. However, we recognize that students who are caretakers may face occasional unexpected challenges creating attendance barriers. Therefore, by exception, a department chair or his or her designee (e.g., instructors) may grant a student permission to bring a guest(s) for a total of two class sessions per semester. This is two sessions total across all courses. No further extensions will be granted. Please note that guests are **not** permitted to attend either cadaver or wet labs. Students are responsible for course material regardless of attendance. For additional information, please review the Classroom Guests of Students policy in its entirety. Link to full policy: http://facstaff.phhp.ufl.edu/services/resourceguide/getstarted.htm

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 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.

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.

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.