STA 4930 – Capstone in Statistics and Data Science
Spring 2025

Course Description: This teamwork-based culminating experience synthesizes methods and skills acquired in statistics and data science courses by working on a data-focused project provided by a partnering institution. Each group will present the results of their analyses in a written report, a poster presentation, and an oral presentation.

Required Prerequisites: STA 4210 & 3 additional credits in STA 4XXX & (BS or BA STA or DAT major or STA minor or ACS minor)

Instructor: Dr. Elizabeth Johnson
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Class Meeting Times:

Day: Tuesday
Time: Periods 6&7 (12:50 – 2:45 PM)
Location: TUR 2350

Day: Wednesday
Time: Period 8 (3:00-3:50 PM)
Location: AND 0021 and/or Zoom

Course Goals: This course is a unifying experience that links statistical concepts across courses and provides a framework for conducting independent research. Students will further develop their skills in exploring data, building, and fitting models, investigating model assumptions, interpreting results, and reporting findings to various stakeholders.

Learning Outcomes: Upon successful completion of this course students will:

- integrate their knowledge from previous courses to conduct an original research project.
- build collaborative skills by working with professionals in related fields.
- develop effective communication (written and oral) skills by presenting the results of their research to both technical and non-technical audiences.
- Enhance competency when using statistical software.

Selected Readings and Resources*:*

Gareth James, et al. 2013. An Introduction to Statistical Learning with Applications in R, Springer. Free pdf download available at An Introduction to Statistical Learning (statlearning.com) Access to slides and 15 hours of lecture videos available at In-depth introduction to machine learning in 15 hours of expert videos | R-bloggers

Hadley Wickham and Garrett Grolemund , 2017. R for Data Science, O'Reilly, Addison Wesley
Download free pdf at Welcome | R for Data Science (had.co.nz)

Miller, Jane E., The Chicago Guide to Writing About Multivariate Analysis, second edition, Chicago, 2013

Selected course readings related to the study, such as journal articles, will be posted on the Canvas site.

Software: R and selected R packages constitute the primary software for this class. The Comprehensive R Archive (CRAN) is the primary place to download R. RStudio is the recommend integrated development environment for using R. RStudio Download. The Free Desktop version is fine. Other software packages may also be utilized such as Python or SAS JMP Pro.

Course Assignments

Your final course grade will be based on a variety of assignment types that are described below. Due dates will be posted on the course schedule in Canvas and announced in class.

Individual assignments:

***Professional Talks*:** Students will attend or view three approved professional presentations and write a one-page summary and reflection of the strengths and weaknesses of the presentation.

***Project Critiques*:** It is very important to watch the work of your peers so each student will be required to provide constructive comments on two other group project initial presentations.

Class discussions and reflections: Reading assignments will be posted covering topics such as data ethics, professionalism, presentation skills, and communication. You are expected to participate in all in-class exercises and discussions by completing the required readings or activities and submitting any required reflection statements.

Team-based assignments:

Weekly Team Status Report: Each group will submit a weekly project status update which will include a summary of tasks in progress, completed and planned. The form is posted on Canvas.

Project Presentations: Two formal project updates will be given during the semester to provide information on the progress of the project. Each team member will be required to create and present three or four slides of steps taken so far and the next steps. The project updates should address each individual's contribution to the group's overall goal. A final presentation consisting of at most 15 slides will be given at the end of the semester.

Research Paper: A report of no more than 20 pages describing the results of each project that includes the following:

- The research question(s).
- Background/significance of the research.
- The methods used to obtain and analyze the data.
- The results of the analysis (tables, charts, graphs, significance, confidence intervals, descriptive text).
- A discussion of the research, the limitations of the current research, reasonableness of any assumptions made, possibilities of future work/studies that should be conducted, etc.
- Title page and a one-paragraph abstract of the entire project with a recommended length of no more than 150 words.

Poster: Each project team will submit a single slide electronic poster presentation which is a one-page presentation that tells a story about their set of data. Guidelines for construction of a poster presentation can be found at: https://ww2.amstat.org/meetings/qdet2/presentationtips.cfm

Project Code: Each group will submit any relevant code formatted from R Markdown, Jupyter Notebooks, GitHub or a similar format.

Grading Scheme:

Individual Assignments:	
Professional Talks (3@5% each)	15%
Project Critiques (2@3% each)	6%
Class discussions	4%
Team-based Assignments:	
Weekly Status Reports	5%
Presentation #1- Research Questions and EDA	5%
Presentation #2 - Data Analysis	5%
Final Presentation	10%
Research Paper	20%
Poster	10%
Project Code	20%

The instructor reserves the right to adjust the percentages if needed.

Grading Scale:

Numeric Score	Letter Grade	Numeric Score	Letter Grade
93 – 100	A	77– 79	C+
90 – 92	A–	71 – 76	C
87 – 89	B+	67 – 70	C–
83 – 86	B	60 – 66	D
80 – 82	B–	0 – 59	E

Course Policies

Grading Policies:

*Requirements for class attendance and make-up exams, assignments, and other work in this course as well as policies regarding absences, religious holidays, illness, and student athletes are consistent with UF Attendance Policies.

Additional make-up policy requirements:

- Every effort should be made to complete the assignment/exam during the open period. Only extreme situations will warrant a makeup. Contact the instructor prior to the exam - as soon as you realize you will be unable to take the assignment/exam at the scheduled time. Each case will be reviewed individually. Valid and detailed documentation is a prerequisite for scheduling a makeup under such extenuating circumstances.
- If you have an emergency on the day of the assignment/exam, the instructor must be contacted by midnight of the day of the assignment/exam.
- Make-up exams will be scheduled within a week from the assignment deadline. Student is responsible for attending scheduled make-up. Instructor reserves the right to utilize the UF posted final exam day as a make-up date.

- Additional Note: Being on vacation or booking a trip prior to the completion of the semester is not a valid reason to request a makeup. Please reference the most recent Academic Calendar, https://catalog.ufl.edu/UGRD/dates-deadlines/pdfs/.

*If you have a disability that requires academic accommodation, contact the Disability Resource Center (DRC). The DRC will provide documentation to the students who must then provide this documentation to the instructor when requesting information. You must submit this documentation prior to submitting any assignments for which you are requesting accommodation.

* Incompletes are only assigned when extraordinary circumstances (such as an accident, or extended hospitalization), arising after the date for dropping the course, prevent the student from completing the course requirements. Having a failing grade in the course is not a valid reason for requesting an Incomplete. Information on Medical Withdrawal can be found at https://umatter.ufl.edu/ . Information on how to Drop a class can be found in UF's Academic Catalog https://catalog.ufl.edu/ and https://catalog.ufl.edu/UGRD/academic-regulations/dropping-courses-withdrawals/

Classroom Behavior: During class students should silence their cellular phones and refrain from eating, drinking, reading newspapers, doing homework, listening to music, excessive talking and all other behaviors that are distracting and disrespectful to the instructor and their fellow students.

Privacy Policy: Student records are confidential. Only information designated "UF directory information" may be released without your written consent. This applies to parents or anyone else who contacts me about your grades.

Faculty Course Evaluations: Student feedback is welcomed by the instructor and beneficial to future students in the course. Students are requested to provide feedback on the quality of instruction in this course by completing a brief confidential evaluation towards the end of the semester at https://evaluations.ufl.edu. Summaries of the evaluation results can be found at https://evaluations.ufl.edu/results.

Other University Services

U Matter, We Care: Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

***Sexual Assault Recovery Services (SARS): Student Health Center, 392-1161**
***University Police Department, 392-1111 (or 9-1-1 for emergencies), http://www.police.ufl.edu**

***Student Health Care Center:** Call 352-392-1161 for 24/7 information to help you find the care you need or visit the Student Health Care Center website.

***GatorWell Health Promotion Services:** For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website or call 352-273-4450.

Academic Resources

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information.

Course Outline

	Topic	Assignment
Week 1	Introduction to the course and data projects. Formation of the project teams.	
Week 2	Developing a project plan; strategies for working on a team-based project	Draft project plan due Weekly Status Reports
Week 3	Library information session. Writing technical reports and literature reviews	Professional Talk Critique #1 Weekly Status Reports
Week 4	Variable types and descriptive measures	Revised project plan due Weekly Status Reports
Week 5	Presentation #1	Project Critique #1 Weekly Status Reports
Week 6	Choosing tools for presenting numbers—tables, charts, and prose	Weekly Status Reports
Week 7	How to effectively include graphs and tables in a report	Professional Talk Critique #2 Weekly Status Reports
Week 8	Planning a speech and creating effective slides	Weekly Status Reports
Week 9	Presentation #2	Project Critique #2 Weekly Status Reports
Week 10	Presenting statistical results to lay audiences	Professional Talk Critique #3 Weekly Status Reports
Week 11	Preparing and presenting research posters	Weekly Status Reports
Week 12	Project work	Poster due
Week 13	e-Poster presentation	Draft final report due
Week 14	Project work	
Week 15	Final Project Presentations	Final Written Report due Submit computer code