STA 3180 — Statistical Modeling – Spring 2026
Tu 4th-5th Th 4th – FLG0280 - Section 18775

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Text: An Introduction to Statistical Learning with Applications in R, 2nd Ed. By G. James, D. Witten, T. Hastie, and R. Tibshirani. Link: https://www.statlearning.com/

Other useful text: R for Data Science by H. Wickham and G. Grolemund Link: https://r4ds.had.co.nz/

Calculator: A calculator will be needed for exams with basic operations, along with square root, log, and exponential functions. (e.g. TI-30).

Course Description

This course provides an introduction to modern statistical methods that can be applied to large and complex datasets that arise in a wide range of academic fields and professions. The course will focus on practical applications of these methods and their interpretations. The course is designed for students who are not statistics or data science majors and is the third core course in the data analytics certificate program.

Course Objectives

- Use the statistical program R for the following:
  - Analyze data with simple and multiple linear regression
  - Analyze data with logistic regression and linear discriminant analysis
  - Analyze data making use of cross-validation and the bootstrap
  - Analyze data with polynomial regression and smoothing methods
  - Analyze data with tree-based methods
  - Analyze data with clustering methods
- Students will be able to make inferences about relations among variables.
- Build collaborative skills working on a group research project.

Other Materials: Datasets, assignments, and overheads available on class website and Canvas.

Web Site: UF Canvas and http://www.stat.ufl.edu/~winner/

Course Assignments (Posted on Canvas along with due dates)

Computer Lab Activities: There will be 7 lab activities. These are in class and attendance is necessary. Students will work in rotating groups, but each student will need to submit their own report to be graded. Late assignments will receive a 20% penalty, and must be uploaded within one day of due date.

Exams: There will be three in-class exams which will involve reading and interpreting statistical output, answering conceptual questions, and making statistical calculations.

Group Project: Students will work in assigned or self-selected teams of no more than four people to complete a research project based on a topic of interest. Each team will: 1) write a statistical paper, of approximately 5-7 pages, and 2) prepare two 10-minute video presentations of the project. The first video will cover the introduction, research questions and the data collection process while the second video will contain the methods, results and conclusions for your project. Rubrics will be provided.

Each group must obtain approval of their data set and research questions before data analysis begins. Each group must submit a statement of each member's duties in the project, i.e., data cleaner, literature reviewer, etc. Each member of a team will be required to utilize a different statistical technique or type of analysis to analyze the common data set and include their own contribution in the final common report and video. If a student fails to perform their duties as part of the group a point deduction may be applied to that student's individual project grade.

It is very important to review the work of your peers so each student will be assigned to view two other group project videos and to provide constructive comments on each video. Discussion topics will be provided.

Grading: Grades will be based on points from Computer Lab Activities, Exams, and Final Projects. Grades are not negotiable (unless a miscalculation is made in totaling points). No extra credit will be given.

Missed Exams: Any exams that will be missed must be confirmed as soon as possible, **before** the time of the exam. Documentation must be provided. No early exams will be given under any circumstances.

Prerequisites and Computing:

1. STA 3180 has a pre-requisite of STA 3100.
2. You will need a computer for lab activities. Examples will make use of EXCEL and R; but you will need to make use of R for assignments.

Tentative Schedule by Week

Date	Day	Topics	Topic	Textbook	Assignment Due Dates
13-Jan	Tu	Introduction to Statistical Learning	1	1 and 2	
		Simple Linear Regression/Plots/Inference	1	3.1	
15-Jan	Th	Transformations, Outliers, Influential Cases	2	3.2	
20-Jan	Tu	Multiple Linear Regression and Assumption Checks	2	3.3	
		Lab1: Linear Regression			Lab 1: Thursday 1/22
22-Jan	Th	Model Selection for Multiple Regression	3	6.1	
21-Jan	Tu	Logistic Regression		4.1-4.3	
29-Jan	Th	Lab 2: Logistic Regression	4		Lab 2: Thursday 2/6
3-Feb	Tu	Exam 1: Linear and Logistic Regression	4	4.1-4.3	
5-Feb	Th	Linear Discriminant Analysis	5	4.4	
10-Feb	Tu	Linear Discriminant Analysis	5	4.4	
		Lab 3: Linear Discriminant Analysis			Lab 3: Thursday 2/12
12-Feb	Th	Groups for Projects			Project Teams Formed
17-Feb	Tu	Cross-Validation/Bootstrap	6	5.1-5.2	
19-Feb	Th	Cross-Validation/Bootstrap	6	5.1-5.2	
24-Feb	Tu	Lab 4: Cross-Validation/Bootstrap			Lab 4: Thursday 2/26
26-Feb	Th	Polynomial Regression	7	7.1	
3-Mar	Tu	Exam 2: LDA/CV/Bootstrap/Polynomial Regression			
5-Mar	Th	Smoothing and Transformations	8	7.2-7.4	
10-Mar	Tu	Smoothing and Transformations / Work on Projects			All datatsets and
12-Mar	Th	Tree Based Methods and Random Forests	9	8.1-8.2	
24-Mar	Tu	Lab 5: Polynomial Regression/Smoothing/Trees			Lab 5: Thursday 3/26
26-Mar	Th	Work on Projects			
31-Mar	Tu	Cluster Analysis	10	12.1,12.4	
2-Apr	Th	Cluster Analysis	10	12.4	
7-Apr	Tu	Lab 6: Cluster Analysis			
		Work on Projects			Lab 6: Thursday 4/9
9-Apr	Th	Principal Components Analysis (PCA)	11	12.2	Project draft analysis
14-Apr	Tu	Principal Components Analysis (PCA)	11	12.2	
		Lab 7: PCA			Lab 7: Thursday 4/16
16-Apr	Th	Work on Projects			
21-Apr	Tu	Exam 3: Smoothing, Cluster Analysis, PCA			
24-Apr	Fr	Projects Due (Video and Written)			

Tests and Grading (Any exam dates that are cancelled, exams will be on the next class date).

- Exams (3 @ 16% Each) 48%
- Computer Labs (Best 6 @ 5% Each) 30%
- Group Research Project
    - Video Presentations 10%
    - Written report (rubric will be provided) 9%
    - Group Critiques 3%

Maximum Course Grade Cut-offs (Grades are not rounded to integer values):

A	A-	B+	B	B-	C+	C	C-	D	E
92	87.5	85	80	75	70	65	60	50	

Attendance/Exam/Assignment Policies: While attendance is not taken, students are expected to attend lectures and participate in class. Make-up exams will only be considered with documented medical event or conference attendance. Early exams will be given under no circumstances. Assignments are to be uploaded to Canvas on the date the assignment is due. Please turn off cell phones during classes.

Academic Accommodations:

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. See the "Get Started With the DRC" webpage on the Disability Resource Center site. 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.

University Grading Points:

A	A-	B+	B	B-	C+	C	C-	D	E
4	3.67	3.33	3	2.67	2.33	2	1.67	1	0

Online Course Evaluations:

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 2 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/.

University Policies:

Academic Dishonesty

UF students are bound by The Honor Pledge which states "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students 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." The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. See the UF Conduct Code website for more information. If you have any questions or concerns, please consult with the instructor or TAs in this class.

In-Class Recording suggested wording: • Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. Th only allowable purposes are (1) for personal education use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor. A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation,

and deliver by an instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentation such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private 3 conversations between students in the class or between a student and the faculty or guest lecturer during a class session. Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless, of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third-party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

Campus Resources:

This course complies with all UF academic policies. For information on those polices and for resources for students, please see https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/

Incomplete: An incomplete grade may be assigned at the discretion of the instructor as an interim grade for a course in which the student has completed a major portion of the course with a passing grade, been unable to complete course requirements before the end of the term because of extenuating circumstances, and obtained agreement from the instructor and arranged for resolution of the incomplete grade in the next term. Instructors are not required to assign incomplete grades. For complete details please visit:
CLAS incomplete grade policies and forms.