Contacts

Instructor	email	office	office hours
Dr. Daniel Spieler	spieler@gatech.edu	JS Coon 132	W 1:30 to 3pm or by appt
Lab Instructor			
Skip Hauenstein	chauenstein3@gatech.edu	JS Coon 137	T Th 3-4pm or by appt
Teaching Asst.			
Robert Ashwill	r.t.ashwill@gatech.edu	JS Coon G18	T Th 11am-12pm or by appt

Description

This course provides an introduction to the principles and practice of inferential statistics. Our emphasis is on the analysis and interpretation of data typically encountered in the social sciences. We cover the range of parametric methods including classical one and two sample tests, and analyses of quantitative data with both categorical and continuous predictors using the General Linear Model as an overarching framework. As an applied statistics course, we emphasize the application of statistical methods to data analyses over developing the mathematical foundations for these methods.

Course Objectives

By the end of this course you should:

- Have (some) understanding of the probabilistic basis of traditional inferential statistics.
- Be able to define models that capture particular hypotheses about the structure of data.
- Evaluate the adequacy of these models for parsimoniously capturing the theoretically relevant structure of the data.
- Describe the theoretical implications for preferring one model over alternative models.
- Gain some understanding of where your statistical knowledge ends and where to go to expand your knowledge to suit your research questions.

Required Texts

Judd, C. M., McClelland, G. H., & Ryan, C. S. (2009). Data Analysis: A model comparison approach. 3rd Edition. New York, NY: Routledge.

(I understand that there may be 2nd editions of this text available. I do not know precisely the differences so if you use the 2nd edition, I would suggest that you also check this against the 3rd edition to ensure you are not missing something)

Diez, D. M, Barr, C. D., & Çetinkaya-Rundel, M. (2015) OpenIntro Statistics. 3rd ed. Creative Commons License. PDF

Lecture

In lectures, I will walk through the rationale for the statistical methods, assumptions one makes in using these methods, and advantages and disadvantages of these methods. In some cases, we will develop the underlying mathematical principles for these method while in other cases we will discuss the methods in more applied contexts. The goal is to provide insights into why we approach statistical analysis in a particular way, why we select some methods over others, and how these choices constrain what we can say about our analyses (and our data).

Lab Section

There is a weekly laboratory section for this course. This lab is designed to provide you experience in the application of the statistical methods. The overriding objective of this lab is for you to develop the skills necessary to analyze data effectively. This includes both the mechanics of using statistical software and making intelligent choices about the appropriate statistical methods based on the structure of the data.

Exams

Exam format is in-class combination of multiple choice and open format (typically statistical calculations and interpretation). Exams are closed book and closed notes with the exception of 3 sheets of paper containing any notes that you think might be useful. A calculator will be needed for some calculations. You may not use the calculator app on your phone. No other electronic devices are allowed. The final exam is cumulative although with a heavier weighting on material covered since the previous exam. Study guides and sample problems are provided prior to the exams. You may also think of the homework problems as examples of the type of open format questions you might see on the exam (albeit sometimes with more calculations.)

Quizzes

In class quizzes will be given occasionally throughout the semester. There will be at least 8 and no more than 12 quizzes. No make up quizzes will be given. You may miss one quiz during the semester with no penalty.

Lab Assignments

Each week in lab you will receive an assignment that involves using SPSS to perform calculations and providing answers to questions related to the calculations. These assignments should be completed by the end the lab session. At the end of the semester, your lowest lab assignment will be replaced with your average lab assignment grade (calculated prior to dropping a score).

Homework

Homework assignments will typically be made available in lab, to be completed and turned in the following week. Submission of homework may be either in written form or

electronically (for logistical purposes, we may specify paper or electronic submissions but if not specified, either format is accepted.) You may talk to classmates about homework problems but homework assignments are not group efforts and you should perform the calculations and answer the questions yourself. At the end of the semester, your lowest homework assignment will be replaced with your average homework grade (calculated prior to dropping a score).

Take Home Project

In November, we will provide you with one or more datasets along with a set of questions to be addressed in your analyses of these data. Your task is to identify the appropriate methods to address these questions and provide your best answer to these questions. No collaboration is allowed in the completion of this project. The time needed to complete the project is in the range of 8 to 10 hours.

Calculation of Final Grades

Grading is based on a weighted combination of points from each of the categories below. Components made up of multiple individual assignments (e.g., Homework) will count each assignment equally towards the total for that component. The final point tally is based on a weighted combination of these components. The weighting is shown below:

Midterm Exam 1	15%
Midterm Exam 2	15%
Final Exam	20%
Quizzes	10%
In Lab Assignments	15%
Homework Assignments	15%
Take home project	10%
Total	**100%**

Software

The market for statistical software has evolved such that there are, for the most part, three main software platforms for statistical modeling, SPSS, SAS, and the open source R language and environment. In other domains you might encounter STATA (economics), matlab (engineering) and a few other niche software packages. To provide you with experience applying the methods that we discuss, we have selected SPSS. Unless otherwise noted, we want the analyses conducted in SPSS. You will have access to SPSS for all analyses.

While we have selected SPSS (for now...), examples in class will also show the output of SAS and R as well as SPSS.

Canvas

Course materials will be distributed via Canvas. Note that the Deiz et al textbook is available as a PDF. Powerpoint slides from lecture and lab, homework assignments, and in lab assignments will also be make available here. Generally slides will be available prior to class.

Other Applicable Policies

Attendance

I do not explicitly take attendance. However, the structure of the course assumes that you will attend class and lab. Missed quizzes and lab assignments will result in poorer performance in the course. Even in the absence of missed assignments, attendance is strongly related to final performance in the course.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. For information on Georgia Tech's Academic Honor Code, please visit http://www.catalog.gatech.edu/policies/honor-code/ or http://www.catalog.gatech.edu/rules/18/.

I encourage students to collaborate in learning the material and studying for exams. However, exams, homework, and any other graded assignments are assumed to reflect your individual effort. Use or provision of assistance on exams is prohibited. Copying intermediate work or answers from classmates or any other sources is unauthorized collaboration. Discussion of the steps needed to answer questions is acceptable. Any student suspected of violating this policy will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations. Generally the penalty is a zero for the assignment or for that component of the grade.

Individuals Requiring Accommodations

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (often referred to as ADAPTS) at (404)89-2563 or http://disabilityservices.gatech.edu/,as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Student-Faculty Expectations

At Georgia Tech we believe that it is important to continually strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. See http://www.catalog.gatech.edu/rules/22/ for an articulation of some basic expectations – that you can have of me, and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech, while in this class.

Schedule of Topics and Associated Readings

Here is the schedule 📄. OpenIntro refers to the OpenIntro Statistics text (PDF 📄) and JMR Refers to the Judd, McClelland & Ryan textbook.