MGT 4050 Syllabus

Business Analytics, Section C, 3 Credits

Fall 2026

Instructor Information

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General Course Information

Description

Today, businesses, consumers, and societies leave behind massive amounts of data as a by-product of their activities. Leading-edge companies in every industry are using analytics to replace intuition and guesswork in their decision-making. As a result, managers are collecting and analyzing enormous data sets to discover new patterns and insights and running controlled experiments to test hypotheses.

This course prepares students to understand business analytics and become leaders in their areas in business organizations. This course teaches the scientific process of transforming data into insights for making better business decisions. It covers the methodologies, issues, and challenges related to analyzing business data. It will illustrate the processes of analytics by allowing students to apply business analytics algorithms and methodologies to business problems. The use of examples places business analytics techniques in context and teaches students how to avoid the common pitfalls, emphasizing the importance of applying proper business analytics techniques.

Course Learning Outcomes

Upon successful completion of this course, you should be able to

- Students should be able to think critically about data analysis, which includes selecting the right type of analysis for a given task.
- Students should be able to identify opportunities of applying data analytics, in real business settings.
- Students should be well equipped to become data-savvy managers.

Required Course Materials

MAIN: (ISLR) **Introduction to Statistical Learning, 2nd Edition**. Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani. It is available for download at statlearning.com

OPTIONAL: (Galit) **Machine Learning for Business Analytics: Concepts**, Techniques, and Applications in R, 2nd Edition, Galit Shmueli, et al., Wiley, ISBN-13: 978-1119835172. You can find it on Amazon.

Software

Please ensure that you have up-to-date versions of the operating systems (Windows, Linux, or macOS). Please see http://sco.gatech.edu/ for more information.

Ensure that you have administrator rights on your laptop, as you may occasionally need to install R, RStudio, and R packages.

We will learn business analytics using open-source software. Please follow the instructions provided on their respective websites and install the following software on your personal computer:

1. R and RStudio: RStudio Desktop - Posit (note: first install R and then install RStudio).
2. Complete Microsoft Office Suite or comparable, and the ability to use Adobe PDF software (install, download, open, and convert)
3. Mozilla Firefox, Chrome, and/or Safari browsers Here are some resources on how to learn R:

- There are several R courses in LinkedIn Learning. Home | LinkedIn Learning (gatech.edu) After logging in to LinkedIn Learning using your GT credentials, you have access to a lot of materials.
- http://www.cookbook-r.com/ This is a cookbook for R developed by Winston Chang.
- R for Data Science, R for Data Science (2e) (hadley.nz). You can view it online or buy a hard copy.

Grading Policy

Grades will be assigned on the following basis:

1.	Class Attendance (5; worth 2% each)	10%
2.	Individual Assignments (5; worth 10% each)	50%
3.	Group Final Project Presentation	20%
4.	Group Final Project Report	20%

The conversion of Percentage Scores to Letter Grades is expected to be as follows: Rounding: Final percentage points will be rounded to the nearest integer. For example, 89.6% = 90% while 89.4% = 89%.

A = 89.5% – 100.0% (above 90% with rounding)

B = 79.5% – 89.4% (80-89% with rounding)

C = 69.5% – 79.4% (70-79% with rounding) D = 59.5% – 69.4% (60-69% with rounding)

F = 0% – 59.4% (0-59% with rounding)

Description of Graded Components

Class Attendance

This class should be a common in-person learning experience. Therefore, you need to take ownership and initiative for the success of this class.

You must attend each class on time and become fully prepared to participate in discussions. This includes completing all assigned readings before class. Simply skimming the materials is not sufficient. You are expected to critically reflect on the readings and demonstrate an understanding of the key issues and problems, as this preparation forms the foundation for our live discussions and activities.

Attendance will be checked five times during the semester, with each check worth 2% of your final grade. Attendance may be verified through brief in-class quiz questions, polls, or short submissions, which must be completed during the live session or submitted with the corresponding homework assignment, as instructed.

Individual assignments

There are five individual homework assignments to be submitted. Detailed explanations of each assignment will be posted on the course website. Each assignment should be submitted on Canvas by the deadline. Each assignment must be submitted no later than the deadline. Any submission made after this time (in minutes, hours, or days) will not be accepted. There is NO GRACE PERIOD for the submission of assignments. Students are responsible for ensuring that their individual assignments are submitted in a timely manner in accordance with the course guidelines.

Each of the five assignments is equally weighted and will contribute 50%/5 = 10% towards the course grade. Note that the raw points for each assignment may vary. So, one assignment could have a total of 300 points and another a total of 100 points, but both carry equal weight as far as the course total score is concerned.

Except as explicitly noted otherwise, you are expected to complete your assignments on your own—without interacting with others on the completion of your assignment. You are free, of course, to discuss the concepts or similar problems with your classmates, e.g., to understand how to get R to do generally (not on specific homework problems), and then to complete your assignment on your own.

With the support of your classmates and me, we operate under a "diligent attempt but limited frustration" policy: (1) If you get stuck on something, spend some time Googling to try to find the answer. If you seem to be moving forward, keep going. That search and discovery will pay off, both in terms of direct learning about how to do what you need to do, and in terms of your learning how to find such things out. BUT (2) limit frustration— start your assignments early enough that if you run into a wall, you can just stop searching and ask about it. If you feel you have not made progress after 1 hour of being stuck, stop and ask your classmates or post on the discussion board. If you don't get a resolution, escalate it to TA or to me.

You can contact the TA/professor whenever you have questions, but please note that last-minute help may not be available, as we may be busy on the day that an assignment is due! You may want to begin your homework early to allow sufficient time for completion.

Final Project

There is one final team project (maximum team size: 4 students). A detailed explanation of the project will be posted on the class CANVAS website. Students will substantially contribute to the completion of the team project in this course. The project provides students with an opportunity to creatively consider how the knowledge learned in this class can be applied to a real-world analytics problem in business.

The team project includes two deliverables: a final project report and a final project presentation. All presentations must be submitted no later than the start of class on the day they are due. Any submission after that time (whether in minutes, hours, or days) will not be accepted. There is NO GRACE PERIOD for the submission of team project deliverables. ALL members of the team are responsible for ensuring that team projects are submitted in a timely manner in accordance with the course guidelines. The presentation and the report should be submitted on Canvas.

Note that free riders will get no credit for the project. Every student is expected to contribute equally across all phases of a project, and we will ask each team member to evaluate the contributions of other team members; these evaluations will be considered in the grading of the final project.

Each group is required to give the final project presentation. Presentations will be evaluated based on completeness, substance, depth of analysis, style, and handling of questions. Submit your group presentation slides and the project report electronically on Canvas before the final class.

Course Policies

Attendance and/or Participation

Students are expected to fully participate in the class. If you must be absent for valid reasons, such as an emergency, you must notify the instructor as early as possible. Examples of these valid reasons include participation in official Institute activities such as an athletic event as a member of the team or staff or representing the Institute as part of a competition or conference, or mandatory military deployment. Absences for any sincerely held religious belief, observance, or practice will be accommodated where reasonable. If you miss points for some activity on a given day, it is up to you to not to miss other opportunities to earn points.

Students are expected to devote at least 10 hours per week to completing the course requirements. Initially, you will be getting familiar with R, which has a steep learning curve. However, this investment is worthwhile because R is widely used in the business analytics/data science communities worldwide.

This estimate of effort encompasses all class activities, including reading the textbook and supplementary resources, participating in office hours and forum discussions, completing homework assignments, and studying for exams. Of course, students can spend as much time as necessary, but it is important to avoid falling behind.

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. Review Georgia Tech's Honor Code and the student Code of Conduct.

Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) 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 Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. The Student-Faculty Expectations articulate 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.

Collaboration, Group Work, and Use of Generative AI

You are encouraged to discuss assignments, and course materials with your peers. However, all work that you submit must be written independently and reflect your own understanding. The use of generative AI tools (e.g., ChatGPT) is permitted to support your work on assignments. However, you are expected to critically evaluate and verify any AI generated content, and you must be able to clearly understand, explain, and defend all material included in your submissions.

Campus Resources for Students

Undergraduate Student Academic Success Resources:

A list of resources for undergraduate students' academic success and information about advising can be found at Success at Tech

- Academic Support: Academic Success and Advising (a unit in the Office of Undergraduate Education & Student Success) provides free support for your courses. Students can attend scheduled supplemental review (PLUS) sessions, stop by Drop-In Tutoring, or schedule a one-on-one appointment through Knack. To explore what options work best for you, please visit us online at success.gatech.edu/tutoring, email us at tutoring@gatech.edu, or come see us at Clough Undergraduate Learning Commons, Suite 283.

Student Well-Being:

At Georgia Tech, we are concerned about your overall physical, social, and mental wellbeing. A comprehensive list of wellness related resources has been compiled and maintained by the Office of the Vice President for Student Engagement and Well-being (student-resource-guide (gatech.edu).