MGT 4050B Syllabus

Business Analytics | 3 Credit Hours

Spring 2027

Tentative syllabus - subject to change. Version: October 30, 2026.

Instructor Information

Instructor: Professor Pan Li
Email: pan.li@scheller.gatech.edu
Office: Scheller College of Business, Room 4283
Office hours: Tuesday, 10 AM to 11 AM, in the office. Appointment via email preferred.
Teaching assistant: TBD
TA email and office hours: TBD

General Course Information

Class meetings: Monday and Wednesday, 5:00 PM to 6:15 PM
Location: Georgia Tech-Atlanta campus, Scheller College of Business, Room 224
Term dates: January 11-May 6, 2027
Course modality: All classes meet in person. Attendance at every class is expected.
Course website: Canvas
Final project team formulation: See the Spring 2027 course site on Canvas.
Guest speakers: TBD

Course 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

By the end of the course, students will be able to:

1. Apply data analytics to business problems. Students should be able to assess whether and how data and business analytics can improve business performance.

2. Develop business analytics ideas, develop and interpret appropriate models, analyze data using business analytics software, and generate business insights.

3. Have a decent command of R.

Required Course Materials

Main: (ISLR) *An Introduction to Statistical Learning with Applications in R*, 2nd edition. Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani. Springer, 2021. Hardcover ISBN: 978-1-0716-1417-4; eBook ISBN: 978-1-0716-1418-1. A free PDF is available 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 and R Resources

Please ensure that you have up-to-date versions of the operating systems (Windows, Linux, or macOS). Please see 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. After logging in using your GT credentials, you have access to a lot of materials.

Cookbook for R is a cookbook for R developed by Winston Chang.

R for Data Science, 2nd edition: You can view it online or buy a hard copy - I liked this book a lot.

Course Norms and Expectations

We use lectures, demo sessions, and in-class discussions in this course. Students in the class are welcome to ask questions; students are co-producers of class discussions and collective learning. For this to happen, class members need to listen carefully to one another and build on our critique of previous comments. Discussions need to stay on track, and it is the responsibility of faculty and students to ensure this. Because this course relies on class participation for its success, class norms and expectations regarding class behavior are very important:

1. Attendance at every class is expected. Please schedule other activities outside the times when this class meets. Please arrive on time and remain for the entire class. If you are unable to attend a class, it is your responsibility to read the topics that were covered and what key points that were discussed.

2. The primary reading assignments are mentioned in the course schedule. Other reading assignments, if any, will be posted on the course website on Canvas and/or distributed in class. You are responsible for checking the course website before every class for

announcements, assignments, and schedule changes.

3. We will have a few sessions where we will learn how to use relevant software. It would be very useful for you to have your computers ready to use with every class. I will also demo most analytics techniques in class using RStudio.

Grading Policy

Grades will be assigned on the following basis:

Graded component	Weight
Class Attendance (5; worth 2% each)	10%
Individual Assignments (5; worth 10% each)	50%
Final Project Presentation	20%
Final Project Report	20%

The conversion of percentage scores to letter grades is expected to be as follows. Final percentage points will be rounded to the nearest integer. For example, 89.6% = 90% while 89.4% = 89%. No plus/minus grades are assigned.

A = 89.5%-100.0% (90% or above 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)

Students are expected to participate in the course survey to help future students. We will do the CIOS course survey during the last class of this course. Mid-course student feedback will be collected and used to improve the course further in the second half. The instructor welcomes suggestions and feedback at any time. Please feel free to email me.

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 arrive for each class fully prepared to lead the discussion. You should be able to demonstrate an understanding of the relevant issues and problems in the assigned readings. You must do the assigned readings prior to class. Simply scanning the material is clearly insufficient. You need to critically reflect on the readings, which will lay the foundation for the in-class discussion.

We will check class attendance five times this semester, each worth 2%. To that end, we will leave a few quiz questions in class and ask you to submit your answers with the homework assignment.

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: 5 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.

Student Effort

Students are expected to devote at least 10 hours per week to complete 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.

Generative AI Policy

The use of generative AI tools, such as ChatGPT, is permitted to assist with coding assignments (e.g., debugging or finding scripts). However, please make a note in your assignment if generative AI has been used, and please include all the prompts you used throughout the process.

Accommodations for Students with Disabilities

If you have established accommodations with the Offices of Disability Services, please communicate your approved accommodations to me at your earliest convenience so we can discuss your needs in this course. Any accommodations granted will begin after you present the documentation. Accommodations for a specific event will be considered after the request, but before the event. No retroactive accommodations will be made.

If you have a need but have not yet established accommodations through Disability Services, you should contact Disability Services at 404.894.2563 or dsinfo@gatech.edu or http://disabilityservices.gatech.edu. Disability Services offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process between you, your instructor(s), and Disability Services. Should a new disability be identified during the term, the instructor will work with Disability Services to accommodate your needs from that time forward.

Statement of Intent for Classroom Inclusivity

As a member of the Georgia Tech community, I am committed to creating a learning environment in which all my students feel safe and included. Because we are individuals with diverse needs, I rely on your feedback to achieve this goal. To that end, I invite you to engage in a dialogue with me about the things I can stop, start, and continue doing to make my classroom an environment in which every student feels valued and can actively engage in our learning community.

Academic Integrity and the Georgia Tech Honor Code

The Georgia Tech Honor Code applies to all aspects of the course. If a violation of the honor code is suspected, such as plagiarism or unauthorized collaborations for individual take-home exams, it will be referred directly to the Office of Student Integrity (OSI) for investigation. Please pay attention to the following statements, which are quotes or adaptations directly from Georgia Tech's faculty guidelines ("checklist") for syllabus.

Plagiarizing is defined by Webster's as "to steal and pass off (the ideas or words of another) as one's own use (another's production) without crediting the source." If caught plagiarizing, you will be dealt with according to the GT Academic Honor Code. "Unauthorized use of any previous semester course materials, such as tests, quizzes, homework, projects, and any other coursework, is prohibited in this course. Using these materials will be considered a direct violation of academic policy and will be dealt with according to the GT Academic Honor Code." Thank you for respecting the Georgia Tech Honor Code. Georgia Tech will further strengthen its reputation for high standards and academic integrity. If you have any questions involving these or any other Academic Honor Code issues, please consult me or www.honor.gatech.edu.

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.

Support Services and Resources

In your time at Georgia Tech, you may find yourself in need of support. Below are resources to support you both as a student and as a person.

Academic Success and Advising offers undergraduate tutoring and learning support, including appointment-based tutoring, drop-in tutoring, and Peer-Led Undergraduate Study (PLUS).

For writing and multimedia projects, consult the Communication Center. Your academic advisor can also help you identify appropriate academic resources.

For personal support, consult the Student Resource Guide and resource directory and Georgia Tech health, wellness, and recreation resources.

Tentative Schedule

All dates are in 2027. The schedule and deadlines are subject to change; check Canvas before every class. ISLR refers to the main textbook and Galit to the optional textbook. Supplemental readings will be provided on Canvas.

No.	Date	Topic	Readings	Due
1	01/11/2027	Course Introduction	Syllabus (Canvas)	
2	01/13/2027	R and RStudio Lab	ISLR Section 2.3	
-	01/18/2027	No Class - Martin Luther King Jr. Day		
3	01/20/2027	Linear Regression	ISLR Sections 3.1, 3.2	
4	01/25/2027	Linear Regression (cont.)	ISLR Sections 3.1, 3.2	
5	01/27/2027	Regression Diagnostics	ISLR Section 3.3	Assignment 1 due
6	02/01/2027	Indicator Variables	ISLR Section 3.3	
7	02/03/2027	Indicator Variables (cont.)	ISLR Section 3.3	
8	02/08/2027	Non-linear Transformation	How Do I Interpret a Regression Model (Canvas)	Project team formulation due
9	02/10/2027	Logistic Regression	ISLR Section 4.3	
10	02/15/2027	Logistic Regression (cont.)	ISLR Section 4.3	
11	02/17/2027	Logistic Regression (cont.)	ISLR Section 4.3	Assignment 2 due
12	02/22/2027	Final Project Team Meeting (in person)		
13	02/24/2027	Experiments	Program Evaluation and the Diff-in-Diff Estimator (Canvas)	
14	03/01/2027	Experiments (cont.)	Program Evaluation and the Diff-in-Diff Estimator (Canvas)	
15	03/03/2027	Variable Selection	ISLR Sections 6.1, 6.2	
-	03/08/2027	No Class - Spring Break		
-	03/10/2027	No Class - Spring Break		

Tentative Schedule Continued

No.	Date	Topic	Readings	Due
16	03/15/2027	Variable Selection (cont.)	ISLR Sections 6.1, 6.2	
17	03/17/2027	Cross Validation	ISLR Chapter 5	Assignment 3 due
18	03/22/2027	Cross Validation (cont.)	ISLR Chapter 5	
19	03/24/2027	Tableau Demo		
20	03/29/2027	Decision Trees	ISLR Chapter 8	Assignment 4 due
21	03/31/2027	Decision Trees (cont.)	ISLR Chapter 8	
22	04/05/2027	Decision Trees (cont.)	ISLR Chapter 8	
23	04/07/2027	Clustering	ISLR Section 12.4	
24	04/12/2027	Clustering (cont.)	ISLR Section 12.4	
25	04/14/2027	Association Rules and Collaborative Filtering	Galit Chapter 15	Assignment 5 due
26	04/19/2027	Association Rules and Collaborative Filtering (cont.)	Galit Chapter 15	
27	04/21/2027	Final Project Presentations		Project slides and report due
28	04/26/2027	No Class		

April 28 is a reading day. The Institute final-examination period is April 29-May 6, 2027. The course assessment structure remains the five individual assignments, attendance quizzes, and final project described above.

Academic calendar: Georgia Tech Registrar current academic calendar.