MGT 6452 – Machine Learning for Business

Spring 2027

Instructor	Lizhen Xu, Ph.D. Associate Professor of Information Technology Management Scheller College of Business, Georgia Tech
Instructional Mode	Online Asynchronous

Course Description

The pervasiveness of big data has empowered and called for the need of data-driven decision making for business. Machine learning is a powerful tool to find nontrivial patterns from a large amount of data. With the recent advancement in machine learning algorithms and techniques, it has become an essential tool to aid decision making, deliver managerial insights, and create new opportunities in a large variety of business contexts.

This course introduces a series of popular machine learning techniques and their applications in solving business problems. It covers core concepts, algorithm designs, and programming implementation with real-world data and business examples. Through extensive demonstrations, exercises, and projects, it offers students hands-on experience of applying machine learning techniques to practical business problems. Discussing machine learning in business context equips students with a combination of analytics sophistication and a good sense of how to apply it for business insights.

Learning Objectives

- Explain the common traits of machine learning algorithms and which settings each model is best equipped to handle;
- Design and implement a variety of unsupervised and supervised machine learning methods, ranging from model-based learning to neural networks and deep learning;
- Use the R programming language and various packages to implement different machine learning methods;
- Describe various business contexts and applications where different machine learning methods are suitable.

Course Materials

Primary Textbook	• *An Introduction to Statistical Learning: with Applications in R* **(ISLR)**, Second Edition, *by Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani (2021) Springer (ISBN 978-1071614174)*
Supplementary Textbook	• *Mining Learning for Business Analytics: Concepts, Techniques, and Applications in R* **(MLBA),** Second Edition, *by Galit Shmueli, Peter C. Bruce, Peter Gedeck, Inbal Yahav, Nitin R. Patel (2023) John Wiley & Sons (ISBN 978-1119835172)*

Required Reading	• Lecture notes and other teaching materials listed in schedule and posted on Canvas.
Class Website	• Lecture videos, lecture notes, announcements, assignments, data sets, and additional teaching materials are available on Canvas at http://canvas.gatech.edu/.
Programming Language	• R

Grading

Assignments	**Weights**
Homework 1	10%
Homework 2	15%
Homework 3	15%
Homework 4	15%
Homework 5	15%
Homework 6	15%
Homework 7	15%
Total	**100%**

Final Grading Policy

The final grade in this course is a letter grade. Students should expect that a total percentage grade above 90% converts to an A, between 80% and 90% a B, between 70% and 80% a C, between 60% to 70% a D, and below 60% an F.

Attendance Policy

This course is taught in online asynchronous mode. It is instructor-paced, and the course materials will be released weekly. Students are expected to watch all the videos released each week in time, which will critically determine the quality of learning. Given the asynchronous mode, however, there will be no formal attendance check.

Homework Assignments

Homework assignments are the most important avenue of learning in this course. Each main topic discussed in class will be covered by one homework assignment. Each homework is designed to give students an opportunity to apply the concepts, algorithms, and techniques taught in class to real business examples and datasets. Students need to write and run code in R to apply appropriate machine learning methods to solve the relevant business problems. They need to be able to interpret the results in business contexts and discuss the associated managerial implications.

Each homework assignment may consist of multiple parts of exercises. Students must complete the homework assignments individually and independently. Details of each assignment will be posted on Canvas. Each assignment must be submitted before midnight (11:59PM Eastern Time) on the day it is due.

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/.

Any student suspected of cheating or plagiarizing 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.

Please note that, without the instructor's permission, students are NOT allowed to share the solutions of homework exercises and the answers to the quizzes/tests in this course with other current and future students in any form.

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 (https://catalog.gatech.edu/rules/22/) articulate some basic expectations between students and faculty. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. We shall all commit to the ideals of Georgia Tech while in this class.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 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 the instructor as soon as possible in order to set up a time to discuss your learning needs.