Course Information:	FIN 4346 Applied Machine Learning in Finance
Term	Fall 2026
Days & Times	Thursday 10:00 – 12:45 a.m.

Professor Contact Information

Professor	Dr. Steven Haynes, PhD, ARM, CBCP
Office Phone	972.883.5038
Other Phone	972.632.7552
Email Address	Steven.Haynes@utdallas.edu
Office Location	JSOM 22.439
Office Hours	By appointment: *Book with Me on Teams*
Other Information	Please email from your UTD email address due to FERPA requirements. I am available to meet in person or online via MS Teams.

Course Pre-requisites, Co-requisites, and/or Other Restrictions

None

Course Description

This course offers a practical introduction to machine learning techniques relevant to financial analysis, risk management, investment decisions, and the financial industry. Students gain hands-on experience in preparing and analyzing financial data, choosing and training models, assessing model performance, and interpreting results for business and financial choices. Topics cover supervised and unsupervised learning, regression, classification, decision trees, ensemble methods, clustering, feature engineering, model validation, and predictive analytics. Applications might include credit risk assessment, fraud detection, market analysis, forecasting, portfolio management, risk evaluation, and customer insights. The course also explores issues like model interpretability, overfitting, data quality, bias, governance, and the ethical and regulatory aspects of deploying machine learning in finance. A key focus is on applying machine learning techniques to real-world financial datasets and problems.

Student Learning Objectives/Outcomes

After completing this course, you will be able to:

- Explain fundamental machine learning concepts and methods and evaluate their relevance to financial analysis, risk management, investment decisions, and financial services.

- Prepare and analyze financial datasets for machine learning applications by performing data cleaning, transformation, feature engineering, exploratory analysis, and appropriate treatment of missing or anomalous data.
- Develop and implement supervised machine learning models for financial applications using regression, classification, decision trees, ensemble methods, and other appropriate predictive techniques.
- Apply unsupervised machine learning techniques such as clustering and dimensionality reduction to identify patterns, segments, anomalies, and relationships within financial data.
- Evaluate and compare machine learning models using appropriate performance measures, validation techniques, and financial considerations, including accuracy, precision, recall, ROC-AUC, error measures, overfitting, and economic relevance.
- Apply machine learning techniques to real-world financial problems, including credit risk assessment, fraud detection, financial forecasting, investment analysis, portfolio and risk analysis, and customer analytics.
- Interpret and communicate machine learning results to technical and nontechnical stakeholders using appropriate visualization, model explainability techniques, and financial reasoning.
- Assess the risks, limitations, ethical considerations, and governance requirements associated with machine learning in finance, including model risk, bias, explainability, data quality, privacy, regulatory expectations, and responsible use of artificial intelligence.

Required Textbooks and Materials

Hull, J., Chen, J., Poulos, J.Y. (2025). "Machine learning in business: An introduction to the world of data science." 4th Edition.

Suggested Course Materials

Ask the professor.

Assignments & Academic Calendar

Assignments will be found on Blackboard as assigned by the professor.

Grading Policy

The course will be graded as follows:

Final Exam	30%
DataCamp ML Certification	30%
Business Case Study	30%
Participation	10%

Mid-term grades are provided as guidance only to indicate a student's progress. These grades are based on early coursework, so the student's overall Course Grade may change.

All grades will be posted on eLearning. UTD's grading policies may be found online via the UTD Graduate Catalog. This course will follow this scale:

97.1 – 100	A+
93.33 - 97	A
93.32 – 90.0	A-
89.9 – 86.67	B+
86.66 – 83.3	B
83.2 – 80.0	B-
79.9 – 76.67	C+
76.66 – 73.3	C
73.2 – 70.0	C-
69.9 – 67.67	D+
67.66 – 63.3	D
63.2 – 60.0	D-
Below 60.0	F

Grades will not be "rounded up". For example, if you earn a 79.9, your grade is C. The grades *you earn* are what are posted. I will not make exceptions to this rule.

The professor reserves the right to make extra credit opportunities available to the whole class.

Course Policies

Assignments are due on the date and time stated in class. No late assignments will be accepted, meaning once the assignment closes, I will not accept your assignment (unless you have contacted me before the assignment due date and made special arrangements). All homework must be **typed and double-spaced in 12 pt. font**. Your Assignments should contain the following information in the upper portion of the paper: *name, date, course number and section, and homework title.*

Class Materials

The instructor may provide class materials that will be made available to all students registered for this class, as they are intended to supplement the classroom experience. These materials may be downloaded during the course; however, these materials are for registered students' use. Classroom materials may not be reproduced or shared with those not in class or uploaded to other online environments except to implement an approved AccessAbility Resource Center accommodation. Failure to comply with these University requirements violates the Student Code of Conduct.

Class Attendance

Though the class dates are set, each session's material remains fluid and may be updated throughout the semester. Please make every effort to attend and actively participate in each class meeting. If low attendance becomes a persistent issue, a more restrictive policy may be implemented.

Class Participation

Regular class participation is expected. Students who fail to participate in class regularly invite scholastic difficulty. A portion of the grade for this course is directly tied to your participation in this class. It also includes engaging in group or other activities during class that solicit your feedback on homework assignments, readings, or materials covered in the lectures (and/or labs). Class participation is documented by the faculty. Successful participation is defined as consistently adhering to University requirements, as presented in this syllabus. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Class Recordings

Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the AccessAbility Resource Center has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class or uploaded to other online environments except to implement an approved AccessAbility Resource Center accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Classroom Citizenship

UTD JSOM is a top-rated business school. The course environment is managed with the expectations, behaviors, protocols, and governance of a business professional environment.

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

"As a Comet, I pledge honesty, integrity, and service in all that I do."

Academic Support Resources

The information contained in the following link lists the University's academic support resources for all students. Please see http://go.utdallas.edu/academic-support-resources.

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus. Please review the catalog sections on credit/no credit or pass/fail grading options and on withdrawal from class.

Please go to http://go.utdallas.edu/syllabus-policies for these policies.

Major Themes and Topics:

Topics	Description
1	Introduction
2	Unsupervised learning
3	Supervised Learning: Linear regression
4	Decision Trees
5	SVMs
6	Neural networks
7	Further applications of neural networks
8	Reinforcement learning
9	Natural language processing
10	Sentiment analysis
11	Large language models
12	Model interpretability
13	Issues for society and AI regulations

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.