AI in Business: Insights from Corporate Data

Spring 2026

Course at a Glance

Instructor: Prof. Miao Liu
Email: miao.liu@bc.edu
Office: Fulton/540
Office Hours: Tue/Thu 12:00–1:15pm + by appointment
TA: Balint Czaha (czaha@bc.edu)
TA: Patrick Lanza (lanzapa@bc.edu)

Course Description

The course examines the modern corporate data landscape and how AI turns it into decision-ready insight. Businesses now generate an ocean of information across formats, including numerical data from financial statements and stock prices, textual data from financial filings and conference call transcripts, and visual data from corporate presentations and entrepreneurial pitches to angel investors and venture capitalists. You will learn how to apply machine learning, natural language processing, large language models, and AI agents to real business problems such as tracking consumer sentiment on social media, assessing systematic market risk, and forecasting outcomes on *Shark Tank*. The course also emphasizes corporate valuation and market- and industry-level intelligence with an LLM as a disciplined co-pilot, and develops practical understanding of today's fast-evolving AI adoption in firms, including how AI is embedded in decision workflows and what governance, risks, and controls matter.

Learning Objectives

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

- Understand the role of AI and big data in business decision-making.
- Utilize AI tools to process extensive corporate data, enabling the evaluation of business strategies, risk exposures, and performance predictions.
- Use LLM and AI agent tools safely and productively as co-pilot, not substitutes, for human financial analysis.
- Communicate findings and insights effectively to stakeholders.

1 Prerequisites and Materials

- Introductory Financial Accounting
- This course is built entirely on original, instructor-designed materials, including lecture slides, notes, hands-on example code, case studies, and a custom corporate valuation AI agent developed specifically for this class.

2 Assessment and Grading

Component	Weight
Lab Assignments and Cases (8 write-ups)	40%
Quiz and in-class Lab	35%
Final Project	20%
Class Participation (discussion + in-class activities)	5%

3 Course Schedule

Week 1: The AI Era of Business Analysis: Overview

Focus: Course overview; Corporate Data; Intro to LLMs; Human vs AI comparative advantage; Business models, segments, and industry analysis.
AI role: LLM as information explainer and organizer for business descriptions.
Lectures: Jan 13, 15.
Assignment: Lab 1 - LLM-Assisted Business and Industry Analysis of a Self-Selected Company (due Jan 22).

Week 2: Financial Statements, Ratios, and LLM-Aided Interpretation

Focus: Financial statements linkages; Ratio families and DuPont decomposition.
AI role: LLM as interpretation assistant (patterns → plausible drivers).
Lectures: Jan 20, 22.
Assignment: Lab 2 - LLM-Assisted Financial Statement and Ratio Analysis of a Self-Selected Company (due Jan 29).
Deliverable: Lab 1 due Jan 22.

Week 3: Operating Assets & Quality, and LLM-Aided Hypothesis Generator

Focus: Working capital; revenue recognition; Short-Term Red Flags; Long-Lived Assets, intangibles, goodwill, leases, and R&D; critical estimates and capitalization choices.
AI role: LLM as Red-flag hypothesis generator and policy translator for capitalization and critical estimates.
Lectures: Jan 27, 29.
Assignment: Lab 3 (AI-assisted Case Study) - Amazon: The Depreciation Dial in the AI Capex Race (due Feb 5).
Deliverable: Lab 2 due Jan 29.

Week 4: Earnings Quality, and Corporate Valuation using an AI Agent

Focus: Accruals, cash conversion, special items, adjusted vs GAAP earnings; real vs accrual-based earnings management; Multiples toolkit and interpretation.
AI role: LLM as Pattern describer, risk mapper, peer-set designer, critic and narrative coach. Corporate Valuation with an AI Agent
Lectures: Feb 3, 5.
Assignment: Lab 4 - Collaborating with an AI Agent (due Feb 10).
Deliverable: Lab 3 due Feb 5.

Week 5: Synthesis: Quiz 1 and in-class Lab

Deliverable: Lab 4 due Feb 10.
Quiz 1: Feb 10.
In-class Lab: Business Analysis with an AI Agent, Feb 12.

Week 6: Foundations of Machine Learning

Focus: Regressions; Fundamental Trade-off of Machine Learning; Regularization; High-Dimensional Data.
Lectures: Feb 17, 19.
Assignment: Lab 5 - Can You Get a Deal? Predicting Shark Tank Outcomes with Machine Learning (due Feb 26).

Week 7: Trees and Neural Networks

Focus: Trees-based Models; Neural Networks and Deep Learning.
Lectures: Feb 24, 26.
Assignment: Lab 6 (AI-assisted Case Study) - Zillow Offers/iBuying: When the Machine Learning Forecast Breaks (due Mar 12).
Deliverable: Lab 5 due Feb 26.

Week 8: Applications of Machine Learning

Focus: The power, limitations, and risks of AI in real businesses
AI role: Real-world Applications of Machine Learning Models.
Lectures: Mar 10, 12.
Deliverable: Lab 6 due Mar 12.

Week 9: Synthesis: Quiz 2

Quiz 2: Mar 19.

Week 10: Foundations of Natural Language Processing

Focus: NLP: from Bag-of-Words to Embeddings
Lectures: Mar 24, 26.
Assignment: Lab 7 - Sentiment Analysis of Social Media with NLP and BERT (due April 9).

Week 11: Large Language Models

Focus: Introduction to LLMs; Prompt Engineering; AI Agent
AI role: Improve Business Analysis through Prompt Engineering.
Lectures: Mar 31, April 7.

Week 12: Synthesis: Quiz 3

Quiz 3: April 9.
Deliverable: Lab 7 due April 9.

Week 13: LLM-Aided Deep Market Analysis

Focus: Deep market and industry intelligence; Translating market structure into a driver-based forward view (revenue, margins, reinvestment) and disciplined bull/base/bear scenarios.
AI role: Market mapper and scenario architect, plus red-team critic to surface missing evidence and stress-test assumptions.
Lectures: April 14, 16.
Assignment: Lab 8 (AI-assisted Case Study - pick one):
1. Who Has the Most Durable Economics in the Crypto Market?
2. The Bundle Wars: Bundling, Ads, and the Race to Profitable Scale in U.S. Streaming. (due April 23)

Week 14: Integrative Business Analysis: Overview

Focus: Integrative DCF-based analysis framework: linking business model, accounting adjustments, and market intelligence to valuation inputs; identifying and prioritizing valuation-relevant risks using MD&A and Risk Factors; designing a verification plan for key assumptions.
AI role: Structure builder (turn messy disclosures into a driver tree and a risk-to-assumption map), plus citation enforcer to keep claims source-grounded.
Lectures: April 23.
Assignment: Final project Assigned (due May 4th).
Deliverable: Lab 8 due April 23.

Week 15: Integrative Business Analysis: Building the Model

Focus: Build and audit the full model: forecast operating drivers, connect statements, implement DCF (and cross-check with multiples), run sensitivity and scenario tables, and produce an investment-committee-ready narrative with explicit links from numbers to claims.
AI role: Workflow accelerator and red-team reviewer (generate model checklists, catch inconsistencies, propose sensitivity grids, and critique narrative-to-number alignment), while you own all calculations and final assumptions.
Lectures: April 28, 30.
Deliverable: Final project due May 4th.