**Corporate Finance IOE 452/MFG 455**
**The University of Michigan**
**Winter 2026**

**Instructor:**
Reza Kamaly (*rkamaly@umich.edu*)

**Office:** Remote: Zoom.
**Office Hours & Socialization** *TBD,* and by appointment.

**Class Hours:** T&Th, 4:30 PM–6:00 PM.
**Location:** *G906 COOL.*
**Course Website: Canvas** &
`https://ioe452.streamlit.app/`

**Teaching Assistant:**
Jun Hu (*junhuuu@umich.edu*)
**Office & Hours: TBD**
*Tu & Th: 11:00–1:00 PM* Zoom & by appointment.

**Instructional Assistant:**
Iman Dashti (*idashti@umich.edu*)
**Office & Hours: TBD**

**Required Textbook:** Berk and Demarzo, *Corporate Finance*, 6*th* Edition (2024).
No need to purchase!

**Extensive Lecture Notes are provided for each lecture.**

**Prerequisites:** Basic familiarity with rational optimizing economic decision making +
Discounted cash flow analysis (IOE 201).
Basic familiarity with statistics (IOE 265).

Basic familiarity with linear statistical models (IOE 366).

Basic familiarity with optimization methods (IOE 310).

Basic familiarity with Excel, MATLAB, R, Python.

**Grading:**

- Weekly home works (30%).
- Home works must be submitted electronically. *It is the student's responsibility to make sure that the material is submitted completely. No late home works are accepted.*

- Three Midterm exams: **2/10/26**, **3/17/26**, **4/21/26** ($3 \times 21 = 63\%$).

- **No Final Exam!** The third exam is on the last day of class.

- A case study done in a group of up to 4 members (7%). *Must be turned in by the end of the last day of classes on* **4/21/26**. *There are no exceptions.*

- Students will get 2% *extra–credit* towards the total score upon submission of the course evaluation forms during the allotted time.

**Other Requirements:**

- The **three** midterm exams will be held during the lecture hours. Locations are announced well in advance.

- **Case Study.** Available for purchase online, with a cost of ca. $5. Details will be posted on **Canvas**.

- A few students will be selected to have samples of their work, homeworks and examinations, posted on *Accreditation Board for Engineering and Technology.*

- **Make sure we stay connected throughout this semester!**

**Course Description:**

This course introduces quantitative corporate financial decision-making and strategy, emphasizing analytical and computational methods used in modern finance. Topics include discounted cash flow (**DCF**) analysis; fixed-income securities, bond pricing, yield curves, equity valuation, agency issues, corporate bankruptcy, and capital structure; and risk-adjusted valuation using models such as Capital Asset Pricing Model (**CAPM**), Arbitrage Pricing Theory (**APT**), multi-factor models, and Value-at-Risk (**VaR**).

The course applies principles of no-arbitrage, linear and quadratic programming to corporate finance problems. Additional topics include cost of capital, taxation, financial statement analysis, Federal Reserve policy, repo markets, and the roles of private equity and private credit. Time permitting, advanced topics such as credit risk and structured finance are examined, with examples drawn from current financial transactions and the 2008 financial crisis.

Students implement widely used financial models in **R** and **Python** using real-world market data, developing practical, data-driven skills for corporate financial analysis and strategy.cuting corporate financial strategy.

**Honor code:**

All students are expected to be familiar with the Engineering Honor Code, and are bound by its requirements on all homework and examinations. All students in the class are presumed to be decent and honorable, and *all students in the class are bound by the College of Engineering Honor Code*. You may not seek to gain an unfair advantage over your fellow students; you may not consult, look at, or possess the unpublished work of another without their permission; and you must appropriately acknowledge your use of another's work. *Any violation of the honor policies appropriate to each piece of course work will be reported to the Honor Council, and if guilt is established penalties may be imposed by the Honor Council and Faculty Committee on Discipline*. Such penalties can include, but are not limited to, letter grade deductions or expulsion from the University.

**Exams:**

Each student must complete the exam solely by her or his own efforts. Questions can be asked only of me and Jun or Iman. The exam must be completed within the specified time.

**Homework:**

You may discuss this homework assignment with your fellow students at the conceptual level, but must complete all calculations and write–up, from scrap to final form, on your own. Verbatim copying of another student's work is forbidden. You may not consult homework solutions from a previous term unless they are made available in a publicly accessible form (no unfair advantage can be sought).

**Case Studies:**

Case studies are to be completed only within your own group. You may receive help from me, or Jun and Iman. You may consult with members of other groups in the course, but you must complete your group's calculation and project write–up on your own.

**Accommodations for Students with Disabilities**

If you think you need an accommodation for a disability, please let me know at your earliest convenience. Some aspects of this course, the assignments, the in–class activities, and the way the course is usually taught may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Services for Students with Disabilities (SSD) office to help us determine appropriate academic accommodations. SSD (734–763–3000; `http://ssd.umich.edu` typically recommends accommodations through a Verified Individualized Services and Accommodations (VISA) form. Any information you provide is private and confidential and will be treated as such.

**Learning Objectives:**

Upon successful completion of this course, students will be able to recognize the central role of no-arbitrage in well-functioning capital markets and understand the implications of the law of one price for corporate financial decision-making. In particular, students will be able to:

1. **Describe** the institutional and regulatory environments in which corporate financial officers operate.

2. **Analyze** corporate cash flows and apply discounted cash flow (**DCF**) techniques to value fixed-income securities and other corporate asset/liabilities.

3. **Explain** the fundamentals of structured finance and assess their implications for corporate financing decisions.

4. **Evaluate** the risk–return trade-offs inherent in corporate financial decision-making.

5. **Interpret** financial statements, including **EBITDA**, and apply financial ratios in firm valuation.

6. **Explain** the role of credit rating agencies and the information conveyed by the yield curve.

7. **Compute and apply** the weighted average cost of capital (**WACC**) and other risk measures relevant to corporate valuation.

8. **Explain** Markowitz portfolio theory and construct efficient portfolios with and without a risk-free asset.

9. **Implement and interpret** asset pricing models including **CAPM, APT**, portfolio beta, **VaR**, and return correlations.

10. **Assess** the concept of market efficiency and critically evaluate its limitations.

11. **Analyze** capital structure and dividend policy decisions in the presence of taxes, and **discuss** key insights from Modigliani–Miller theory.

12. **Explain** the economic role and implications of Chapter 7 and Chapter 11 bankruptcy proceedings.

13. **Evaluate** corporate governance issues arising from the separation of ownership and control and from asymmetric information.i

14. **Identify and apply** linear and quadratic programming methods in financial decision-making.

15. **Explain** the role of the Federal Reserve, including open market operations, and assess their effects on interest rates and corporate valuation.

16. **Analyze** the relevance of asymmetric information, moral hazard, and adverse selection in corporate finance.

17. **Retrieve and analyze** financial data using **R** and **Python**, and perform optimization and statistical analysis of financial models.

18. **Describe** the fundamentals of private equity and venture capital financing.

19. **Explain** the nature of corporate and market funding instruments and assess their roles in the 2008 financial crisis.

**Suggested Reference Material:**

• Ivo Welch, *Corporate Finance*, 5*th* Edition (2022); Either MFE or General Edition. This is a useful and affordable textbook. Free download! `https://book.ivo-welch.info/read/`

• *Tidy Finance with Python* (2044). Christoph Scheuch , Stefan Voigt, Christoph Frey, Patrick Weiss.

• *Tidy Finance with R* (2023). Christoph Scheuch , Stefan Voigt, Christoph Frey, Patrick Weiss.

• *Analyzing Financial Data and Implementing Financial Models Using R.* Clifford S. Ang, 2021.

• Bernstein, L, Peter, *Capital Ideas: The Improbable Origins of Modern Wall Street*, 1 edition. Wiley. 2005. This book covers the genesis of intellectual ideas that have impacted corporate finance and derivative pricing.

• Frank J. Fabozzi, and Pamela Peterson Drake, *The basics of finance an introduction to financial markets, business finance, and portfolio management*, 2010. (Available at Mirlyn).

• Richard A. Brealey, Stewart C. Myers, Franklin Allen, *Principles of Corporate Finance*, McGraw–Hill, 12th ed. (2017)

• Luenberger, G, David, *Investment Science*, Second Edition, Oxford University Press, 2013.

• Hal R. Varian, "The Arbitrage Principle in Financial Economics," *Journal of Economic Perspectives*, Vol. 1, No. 2, 1987.

• Additional references will be posted.

| Semester Schedule | | | |
|---|---|---|---|
| **Week** | **Date** | **Applications** | **Session Details** |
| 1 | 1/08/25 | Introduction to Corporate Finance: Overview | Lec0 |
| | | Time Value of Money, PV, FV,etc. | Lec1 |
| | 1/13/25 | Annuities, Perpetuity | Lec2 |
| 2 | 1/15/25 | NPV | |
| | | Growing Perpetuity, Effective Rates | Lec3 |
| | 1/20/25 | Amortization, Bonds I | |
| 3 | 1/22/24 | Bonds II | Lec4 |
| | | Corporate Bonds, Credit Agencies | |
| | 1/27/25 | IRR, IRR/PE, Profitability Index | Lec5 |
| 4 | 1/29/25 | Bond Sensitivities | |
| | | Duration, Call/Put Features | Lec6 |
| | 2/3/25 | Treasury, Repo, Collateral, FED | |
| 5 | 2/5/25 | Spot Rates, Yield Curve | |
| | | No–Arb., Forward Rates, Swaps | Lec7 |
| | 2/10/25 | **Exam I** | |
| 6 | 2/12/25 | Equity Valuation, Gordon Model, Dividends | Lec8 |
| | | DDM, 2–Stage,Financial Statements, Financial Ratios | Lec9 |
| | 2/17/25 | **Case Study** | |
| 7 | 2/19/25 | Basic Probability, Risk–Return | Lec10 |
| | | Two–Asset Portfolio | Lec11 |
| | 2/24/25 | Efficient Frontier | Lec12 |
| . | 2/26/25 | Markowitz: Mean–Variance Portfolio | Lec13 |
| 8 | | R–Python Data Retrieval, Risk–free Asset | Lec14 |
| | 3/03/25 | **Vacation: No Class!** | |

| Semester Schedule | | | |
|---|---|---|---|
| **Week** | **Date** | **Applications** | **Session Details** |
| 9 | 3/05/25 | **Vacation: No Class!** | Lec15 |
| | | CAPM, Fama–French, Implementation, OLS | |
| | 3/10/25 | Index Models | Lec16 |
| 10 | 3/12/25 | APT, Efficient Markets | Lec17 |
| | | VC & PE | |
| | 3/17/25 | **Exam II** | |
| 11 | 3/19/25 | Credit Risk, Short–Term Financing | Lec18 |
| | | Capital Structure | |
| | 3/24/25 | Cost of Capital, **WACC** | Lec19 |
| 12 | 3/26/25 | Modigliani–Miller, Debt v. Equity | Lec20 |
| | | Uncertainty, Taxes, Inflation | |
| | 3/31/25 | Case | Lec21 |
| 13 | 4/02/25 | Corporate Bankruptcy | |
| | | | Lec22 |
| | 4/07/25 | Share Buybacks | |
| 14 | 4/09/25 | Leverage | Lec23 |
| | | Asymetric Information | |
| | 4/14/25 | Debt financing choices | Lec24 |
| 15 | 4/16/25 | Securitization, MBS | Lec25 |
| | | **Exam III** | |
| | 4/21/25 | **Case Study Due** | Lec26 |