



Financial Products and Introduction to Finance

Syllabus. IRFA & MMMEF.

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1 Summary

This 18-hour course provides a quantitative and applied introduction to major financial products, with a focus on the pricing and mechanics of forward, futures, and options contracts. The course draws from practical market logic, arbitrage principles, and risk-neutral pricing. Students will gain a working understanding of the foundational models used in derivatives markets and their use in risk management.

2 Prerequisites

Basic knowledge of probability and calculus is expected. Familiarity with financial markets or instruments is helpful but not required.

3 Learning Objectives

By the end of this course, students will:

- Understand the key features and valuation of forwards, futures, and options.
- Apply arbitrage arguments to price derivative instruments.
- Use the Black-Scholes model and risk-neutral probabilities for pricing and hedging.
- Grasp the interpretation of the “Greeks” and basic hedging strategies.

4 Course Outline

4.1 General Concepts of Finance and Accounting

- Overview of financial markets

- Double-entry accounting
- Assets, equity, debt dynamics and leverage
- Limited liability and bankruptcy risk

4.2 Forward and Futures Contracts

4.2.1 Fixed Income and Currencies

- Compounding and discounting
- Zero-coupon bonds and Net Present Value
- Forward Rate Agreements (FRAs)
- Forward exchange rates

4.2.2 Equity, introduction to Risk Neutral Valuation

- Cash-and-carry arbitrage
- No-arbitrage and pricing measures
- Risk-neutral expectation and forward prices
- Forward price adjustments for dividends

4.2.3 Futures

- Differences between forwards and futures
- Margining and futures pricing mechanics

4.3 Option Pricing

4.3.1 Definition and arbitrage bounds

- Definitions (call, put, European, American)
- Call-put parity
- Time value and convexity

4.3.2 Black & Scholes formula

- Presentation
- Greeks
- Advanced uses of the BS formula

5 Note to students

Students are encouraged to use R or Python for computational exercises.

While not particularly technical, this course brings together financial objects and mathematical tools which might be difficult at the beginning. Active engagement, completion of readings, and consistent practice are essential for taking the full benefit from it.

References

- [1] John Hull. *Options, futures, & other derivatives. Solutions manual*. Prentice Hall International, 2006.
- [2] Robert L McDonald. *Derivatives markets*. Pearson, 2013.
- [3] Myron Scholes and Fischer Black. The pricing of options and corporate liabilities. *Journal of Political Economy*, 81(3):637–654, 1973.