

FINANCIAL MARKETS AND INVESTMENTS



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MASTER IN ACTUARIAL SCIENCES



MASTER IN MATHEMATICAL FINANCE



EDUNIVERSAL BEST
MASTERS RANKING 2021



SYLLABUS

PART I – FINANCIAL MARKET STRUCTURE AND INSTRUMENTS

1. Market Organization and Structure
 - 1.1. Functions of the Financial System
 - 1.2. Market Classification
 - 1.3. Financial Instruments
 - 1.4. Trading in Financial Markets
 - 1.5. Security Market Indices
2. Pooled Investments
 - 2.1. Investment Funds
 - 2.2. The Process of Portfolio Management

PART II – THEORY OF PORTFOLIO MANAGEMENT

1. Portfolio Concepts
 - 1.1. Risk and Return
2. Mean-Variance Theory (MVT)
 - 2.1. Mean-Variance Approach
 - 2.2. Efficient Portfolios: The Two-Asset Case
 - 2.3. Including the Riskless Asset
 - 2.4. Two Risky Assets with the Riskless Asset
 - 2.5. The General Case
 - 2.6. Portfolio Protection: Safety Criteria
 - 2.7. International Diversification

3. Return Generating Models
 - 3.1. Estimation versus Model Risk
 - 3.2. Constant Correlation Models
 - 3.3. Single-Factor Models
 - 3.4. Fundamental Analysis
 - 3.5. Multi-Factor Models

PART III – SELECTING OF OPTIMAL PORTFOLIOS

1. Expected Utility Theory (EUT)
 - 1.1. Foundations of Utility Theory
 - 1.2. Utility Functions and their Properties
 - 1.3. Risk Tolerance Function and the Optimal Portfolio
2. Alternatives to Utility
 - 2.1. Maximizing Long-Term Growth
 - 2.2. Stochastic Dominance
 - 2.3. Second-Order Stochastic Dominance
 - 2.4. Risk Measures

PART IV – MODELS OF EQUILIBRUM IN CAPITAL MARKETS

1. The Capital Asset Pricing Model (CAPM)
 - 1.1. Standard CAPM
 - 1.2. Non-Standard CAPM
 - 1.3. Testing CAPM
2. The Arbitrage Pricing Theory (APT)
 - 2.1. Deriving APT
 - 2.2. APT versus CAPM
3. Market Efficiency
 - 3.1. Forms of Efficiency
 - 3.2. Testing Efficiency
 - 3.3. Anomalies
4. Behavioral Finance
 - 4.1. Individual Biases
 - 4.2. Group Biases
 - 4.3. Portfolio Issues

LEARNING OUTCOMES

The learning objective statements (LOS) of this course unit can be summarized as follows. By the end of the course the student should:

- LOS 1: Understand the structure of financial markets and the wide variety of the available financial instruments
- LOS 2: Analyse equilibrium in financial markets
- LOS 3: Discuss efficiency in financial markets
- LOS4: Be able to explain and demonstrate the use of fundamentals of portfolio management
- LOS 5: Feel comfortable discussing and implementing all steps of portfolio management, including risk profile evaluation of investors

Each part of the course is connected to the outcomes as follows:

- Part I – Financial Market Structure and Instruments => LOS1
- Part II – Theory of Portfolio Management => LOS4
- Part III – Selecting Optimal Portfolios => LOS5
- Part IV – Models of Equilibrium in Financial Markets => LOS2, LOS3

BIBLIOGRAPHY

Textbooks

Joshi, M. S., and J. M. Paterson (2013). *Introduction to mathematical portfolio theory*. Cambridge University Press.

Elton E.J., M. J. Gruber, S. J. Brown and W. N. Goetzmann (2014), *Modern Portfolio Theory and Investment Analysis*, 9th Edition, Wiley.

Lecture Notes

Gaspar R.M. (2022), *Investments and Portfolio Management*, preprint.

ASSESSMENT

Students are evaluated based upon:

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| • Written Exam | 70% |
| • Computer Exam | 30% |