Master in Finance

First year - Syllabus 2019-2020

UE1: FOUNDATIONS OF ASSET PRICING

Semester: 1
Language: English
ECTS Credits: 6
Lecture Hours: 30
Tutorial Hours: 15

Presentation and intended learning outcomes

Being able to price a financial asset, such as bonds and shares, is the starting point of any financial decisions. The purpose of the module is to provide students with the fundamental principles of asset pricing, using theoretical concepts, empirical evidence and some practical applications. The intention is for the students to increase their knowledge and understanding of modern finance theory.

By the end of the module students should be able to:

- recognize different types of financial assets
- discuss the characteristics and pay-offs of the financial assets
- explain the risk/return trade-off of investment strategies
- describe the benefit of diversification of holding a portfolio of assets
- list the factors which can affect asset prices
- compute the value of financial assets using traditional asset pricing models
- synthesize information and present the results in a written form
- work effectively in a group

Prerequisite

Notions of probability theory and calculus.

Bibliography

- Copeland Weston and Shastri, *Financial Theory and Corporate Policy*, Addison Wesley
- Danthine and Donaldson*, Intermediate Financial Theory,* Prentice Hall 2002
- Cochrane*, Asset Pricing,* Princeton University Press, 2005

UE2: INTRODUCTION TO CORPORATE VALUATION

Semester: 1
Language: English
ECTS Credits: 6
Lecture Hours: 30
Tutorial Hours: 15

Presentation and intended learning outcomes

This course is about how corporations make financial decisions. Topics include asset valuation, capital budgeting, cost of capital, financial reading of accounting statements, capital structure, profit ratios, value creation and price-earnings ratio. Students will learn core concepts and tools to make investment decision and maximize value.

By the end of the module, students should be able to:

- calculate the fair price of a financial instrument
- identify appropriate financial criteria for investment decisions
- integrate risk into the cost of capital
- recognize key financial indicators from financial statements
- perform corporate valuation based on discounted cashflows
- reconcile the book and market value of equity
- calculate price-earnings ratios

Prerequisite

Accounting basics.

Bibliography

- Jonathan Berk and Peter DeMarzo, *Corporate Finance,* Pearson International Edition
- Fred Weston and Thomas Copeland, *Managerial Finance,* 9th edition, The Dryden Press

UE3-1: MATHEMATICS FOR FINANCE AND INSURANCE (OPTIMIZATION FOR FINANCE AND INSURANCE)

Semester: 1
Language: English
ECTS Credits: 3
Lecture Hours: 15
Tutorial Hours: 7.5

Presentation and intended learning outcomes

The purpose of the lectures is to give the mathematical foundations of analysis and optimization needed to present modern and classical economic theory as optimal consumption problems.

By the end of the course, students should be able to:

- explain the main features of multivariate functions
- solve simple problems of constrained optimization
- utilize optimization methods in selected finance applications

Prerequisite

Basic mathematical calculus, including derivative and maximisation/minimisation of a function of one variable.

Bibliography

- Simon, Blume, *Mathematics for Economists,* Norton and Company (June 8, 1994)
- Anthony, Biggs, *Mathematics for Economics and Finance: Methods and Modelling*, Cambridge University Press; 1 edition (July 13, 1996)
- Binmore, Davies, *Calculus: Concepts and Methods,* Cambridge University Press; 2Rev Ed edition (Feb. 7, 2002)

UE3-2: MATHEMATICS FOR FINANCE AND INSURANCE (PROBABILITY FOR FINANCE AND INSURANCE)

Semester: 1
Language: English
ECTS Credits: 3
Lecture Hours: 15
Tutorial Hours: 7.5

Presentation and intended learning outcomes

The purpose of this lecture is to give the mathematical foundations (Probability theory) needed to present modern finance theory, including Mathematical theory of Risk, Portfolio theory, Capital Asset Pricing Model, option pricing, etc.

By the end of the course, students should be able to:

- describe the concept of probability and stochastic variable
- compute the main moments of stochastic variables
- utilize probability theory in selected finance applications

Prerequisite

Basic mathematical calculus, including derivative and integration.

Bibliography

- Konrad Menzel, *Introduction to statistical methods in economics*
- (MIT Open Course Ware: https://ocw.mit.edu/courses/economics/14-30-introduction-to-statistical-methods-in-economics-spring-2009/)
- Robert B. Ash, *Basic probability theory*
- Jacod Protter, *Probability essentials*, Springer

UE4: BUSINESS ECONOMICS

Semester: 1
Language: English
ECTS Credits: 6
Lecture Hours: 30
Tutorial Hours: 15

Presentation and intended learning outcomes

In this course, students will learn to analyse firm's decisions by applying principles of economic analysis. Using the rational behaviour paradigm, we will study how firms should account for their environment—both the nature of consumer demand and the structure of rival competition—when choosing strategic variables such as price, competition, and quality. We will also discuss topics relating to contractual relationships either between firms (vertical restraints, mergers) or within the firm (principal-agent theory).

By the end of the module students should be able to:

- describe the economic foundations for decision making in finance, notably the appreciation of risk
- explain the economic methodology used to analyse situations of strategic interaction (game theory)
- solve simple problems of strategic interaction
- appraise how firms interact strategically in product markets
- communicate effectively in oral form

Prerequisite

Basic Mathematical knowledge (basic algebra, derivatives)

Bibliography

- M.R. Baye, *Managerial Economics and Business Strategy,* Mac Graw-Hill Irvin editor
- L. Cabral, *Introduction to Industrial Organization,* M.I.T. Press
- D. Besanko , *The Economics of Strategy,* Wiley editor
- Robert Pindyck, Daniel Rubinfeld, *Microeconomics,* Pearson

UE5: INTRODUCTION TO FINANCIAL ACCOUNTING AND REPORTING

Semester: 1
Language: English
ECTS Credits: 4
Lecture Hours: 15
Tutorial Hours: 7.5

Presentation and intended learning outcomes

The increase in the internationalization of many industries in recent years has led to an important increase in the number of companies operating globally. Knowledge of international accounting rules is thus becoming increasingly important for the accounting and finance professionals.

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

- explain the main accounting principles and mechanisms
- read and analyse financial statements
- describe and apply some basic international accounting standards
- communicate effectively in oral form
- work effectively in a group

Prerequisite

General accounting background.

Bibliography

- J. Kothari, E. Barone, *Advanced financial accounting: An international approach,* Prentice Hall, 2010.
- H. Stolowy, M. Lebas, *Financial accounting and reporting: A global perspective,* Thomson, 2006.
- B. Elliott, J. Elliott, *Financial accounting and reporting,* Prentice Hall, 2007.
- D. Cootter, *Advances financial reporting: A complete guide to IFRS,* Prentice Hall, 2012.
- Vernimmen, *Corporate Finance: Theory and Practice,* John Wiley & Sons Inc.
- IAS Plus Website: https://www.iasplus.com/en

UE6: INITIATION TO RESEARCH

Semester: 1
Language: English
ECTS Credits: 2
Lecture Hours: 12

Presentation and intended learning outcomes

The capacity to innovate has become a critical skill for the 21st century business person and entrepreneur operating in an ever more complicated and fast changing world. Design thinking and innovative problem-solving use deep theoretical understanding, problem framing, a range of ideation techniques, and critique to generate and develop implementable concepts. The purpose of this course to provide students with conceptual arguments underlying current finance thought and on-going controversies and debates on a selected financial issue. The emphasis is on developing an inquiring mind and a critical approach to conceptual as well as related practical issues.

Upon completion of the course, students should be able to:

- identify research terminology
- describe ethical principles of research, ethical challenges and approval processes
- criticize the research design relevant to a specific research question
- translate academic insights into everyday language
- set up an oral presentation of a research paper
- implement self-management of a project team

Research skills:

- knowledge and intellectual abilities: practical application of research methods; information seeking; analysing; synthesising
- personal effectiveness: integrity; self-reflection; time-management
- research governance and organisation: ethics; project planning and delivery
- engagement, influence and impact: team working; collegiality; communication methods

Prerequisite

Pre-required readings below.

Bibliography

- Brabazon T., 2010, *How not to write a PhD thesis,* Times Higher Education (THE)
- Brabazon T., 2013, *10 truths a PhD supervisor will never tell you,* Times Higher Education (THE)
- Cryer P., 1997, *How to get ahead with a PhD,* Times Higher Education (THE)
- Else H., 2014, *The PhD experience: this far, and no further,* Times Higher Education (THE)
- Short, J., 2009, *The Art of Writing a Review Article.* Journal of Management, volume 35-6, pages 1312-1317

UE7-1: FINANCIAL MARKETS (INTRODUCTION TO DERIVATIVES)

Semester: 2
Language: English
ECTS Credits: 3
Lecture Hours: 15
Tutorial Hours: 15

Presentation and intended learning outcomes

Modern managers can use financial derivatives such as futures, options, and swaps to hedge particular kinds of risk or to change the returns on their portfolios in certain ways. The purpose of this course is to provide the student with the necessary preliminary skills to value simple forward contracts and plain vanilla options by arbitrage. In order to provide a useful treatment of these topics it is necessary to stress fundamentals and to explore topics at a somewhat technical level.

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

- understand what these derivative instruments are
- understand how these derivative instruments may be used to manage risks or design directional strategies
- price simple forward contracts on financial assets by arbitrage
- price a European call or put option in the binomial model of Cox-Ross-Rubinstein
- use Black Merton Scholes formula to price a European call or put option
- communicate effectively in oral form
- work effectively in a group

Prerequisite

This course is a technical course. Students are expected to have a minimum preparation in probability theory (random variables, expectation, conditional expectation, binomial distribution, normal distribution) and statistics.

Bibliography

- Robert L McDonald, *Derivatives Markets,* 3rd edition
- John C Hull, Options, *Futures and Other Derivatives,* 11th edition

UE7-2: FINANCIAL MARKETS (ORGANIZATION OF FINANCIAL MARKETS AND FIXED INCOME)

Semester: 2
Language: English
ECTS Credits: 3
Lecture Hours: 15
Tutorial Hours: 7.5

Presentation and intended learning outcomes

This course provides an extensive introduction to financial markets and its environment. The main objectives are to give an overview of all asset classes and the different financial instruments (stocks, bonds, money market instruments and foreign exchange), to review the regulation of financial markets and their participants, and to understand the functioning of some key markets.

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

- explain the main functions of financial markets
- list the main financial markets and market participants
- describe how markets, banks and insurance companies are regulated
- explain the process of trading in financial markets (limit order book, fixed income markets)
- calculate the value of the main fixed income instruments such as bonds, repo agreements, commercial papers, foreign exchange
- synthesize information and make focused presentation
- work effectively in a group

Prerequisite

None.

Bibliography

- L. Martellini, P. Priaulet, S. Priaulet, *Fixed Income securities: Valuation, Risk Management and Portfolio Strategies*, Wiley Finance
- A. Docherty, F. Viort, *Better Banking: Understanding and Addressing the failures in risk management, governance and regulation,* Wiley
- Websites: BIS, ECB, FED, ISMA, ICMA, SIFMA

UE8: PRINCIPLES OF CORPORATE FINANCE

Semester: 2
Language: English
ECTS Credits: 6
Lecture Hours: 30
Tutorial Hours: 15

Presentation and intended learning outcomes

This course provides theoretical foundations of corporate financial decisions. It aims at understanding how financial decisions (capital structure, capital budgeting, payout policy) contribute to the objective of the firm, in particular to shareholder value maximization. The course also emphasizes the conceptual framework underlying standard corporate valuation techniques.

By the end of the course, students should be able to

- discuss the merits of corporate social responsibility
- compare various sources of external finance
- explain the basic determinants of capital structure
- appraise the tax implications of capital structure choices
- describe basic agency problems arising in corporation
- appraise how financial decisions contribute to the objectives of the firm
- work effectively in a group

Prerequisite

An introductory class to corporate finance and valuation principles is highly recommended. An introductory class to game theory is a plus.

Bibliography

- Brealey-Myers-Allen, *Principles of Corporate Finance,* McGrawHill 10th edition.
- Grinblatt-Titman, *Financial Markets and Corporate Strategy*, McGrawHill 2nd edition.
- Tirole, *The Theory of Corporate Finance,* Princeton U. Press.

UE9: ECONOMETRICS

Semester: 2
Language: English
ECTS Credits: 6
Lecture Hours: 30
Tutorial Hours: 15

Presentation and intended learning outcomes

This class is an introduction to econometrics. The goal is to provide students with methodological and quantitative tools to understand basic econometric models and use them to answer real-world questions. This class introduces models that will facilitate the understanding of the financial econometrics. The emphasis will be put on intuitive understanding of concepts and on examples related to finance.

At the end of the class students should be able to:

- describe the statistical properties of the OLS estimator
- translate an economic argument into a formal econometric test
- implement simple statistical tests of hypothesis
- use statistical packages to estimate econometric models
- provide an economic and statistical interpretation of a regression output
- communicate effectively in oral and written form
- work effectively in a group

Prerequisite

Basic probability and statistical concepts. Linear algebra.

Bibliography

- Wooldridge, Jeffrey M, *Introductory econometrics: A modern approach*, Nelson Education, 2015
- Stock J.H, Watson M.W, *Introduction to Econometrics,* Pearson education, 2014
- Greene, William, *Econometrics analysis,* 7th Edition, Prentice Hall, 2011
- Brooks, Chris*, Introductory Econometrics for Finance,* Cambridge University Press, 2008

UE10-1: INFORMATION TECHNOLOGY FOR FINANCE (PROGRAMMING FOR FINANCE)

Semester: 2
Language: English
ECTS Credits: 3
Tutorial Hours: 30

Presentation and intended learning outcomes

The aim of this course is to introduce the main concepts of algorithmic (variables, data structure, functions and subprograms...) and the main instructions of procedural programming (loops, tests...). The course will use Visual Basic for Applications as programming language as well as graphical formalism to design algorithms.

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

- design an algorithm using a graphical formalism
- implement an algorithm in VBA, following basic best programming practices
- modify and debug an existing program using the VBA editor and a debugger
- develop a simple Excel VBA program using simple interactions with the Excel Object Model

Prerequisite

None.

UE10-2: INFORMATION TECHNOLOGY FOR FINANCE (EXCEL FOR FINANCE)

Semester: 2
Language: English
ECTS Credits: 1.5
Tutorial Hours: 15

Presentation and intended learning outcomes

Modern finance is digital, so mastering digital tools and in particular Excel is among the fundamental requirements for a career in finance. In this course, the student will learn how to use Excel to value firm's financial policies and to price financial securities. The instruction stresses on the best practices to tackle various issues that are commonly at stake.

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

- compute basic financial determinants (NPV, IRR) of an investment project using Excel
- determine the composition of an optimal portfolio using Excel
- compute the cost of capital using Excel
- manage cash holdings using Excel
- price an option using Excel
- communicate effectively in written form
- work effectively in a group

Prerequisite

Computer basics, office tools. Finance courses (NPV, IRR, CAPM, cost of capital…) and being able to use the main Excel functions.

Bibliography

- Brealey and Myers, *Principles of Corporate Finance* (any edition)
- Craig W. Holden, *Excel modeling and estimation in the fundamentals of corporate finance,* Pearson/Prentice Hall

UE10-3: INFORMATION TECHNOLOGY FOR FINANCE (DATABASES)

Semester: 2
Language: English
ECTS Credits: 1.5
Tutorial Hours: 15

Presentation and intended learning outcomes

This course is an introduction to Management Information Systems (MIS) and to one of their main issues: data management. The first goal is to present MIS and how they can help businesses accomplish their goals and objectives. The second and main goal of this course is to present data management: the essential rules allowing designing a coherent database within the framework of a precise activity, and the query languages which allow you to benefit from these data. Acquired competences must allow the students to be able to exploit a database, within the framework of their professional activity, to be interlocutors informed for the design of computerized information systems in their company. The concepts seen in this course are implemented through the DataBase Management System (DBMS) Microsoft Access, which is widespread in the field of micro processing. The students will thus control the essential functions of any DBMS of the market.

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

- explain how a Management Information Systems (MIS) can help businesses accomplish their goals and objectives
- interpret an entity-relationship diagram and translate it into a data model
- create and execute SQL queries on a given database schema
- communicate effectively in oral and written form
- work effectively in a group

Prerequisite

Computer basics, office tools.

Bibliography

- Kenneth C. Laudon and Jane P. Laudon (eds.), *Essentials of Management Information Systems,* Prentice Hall.
- Ramakrishnan R. and Gehrke J. (eds.), *Database Management Systems,* McGraw-Hill Higher Education.

UE11: GROUP PROJECT

Semester: 2
Language: English
ECTS Credits: 3

Presentation and intended learning outcomes

In this module, students are required to carry out a project in finance (e.g., business valuation, financial analysis, option pricing, test of the CAPM model, fund performance). By group of four students, they should define the objectives of the project, the milestones to achieve the objectives, use adequate methods to carry out the analysis, interpret the results and make recommendations with valid justifications for actions. Students should communicate effectively in a well-structured manner both when writing the technical report and when presenting it orally.

By the end of the Module, students should be able to:

- define the objectives of a project and define the milestones to achieve the objectives
- plan and use adequate methods to conduct qualified tasks in given frameworks
- interpret analysis results and make recommendations with valid justifications for actions
- build team spirit, presentation and technical writing skills
- respect and integrate the opinion of others
- communicate effectively in a well-structured manner and build up an open minded attitude

Prerequisite

Basic finance knowledge studied in Asset pricing and Corporate finance.

UE12: PROFESSIONAL DEVELOPMENT WORKSHOP

Semester: 2
Language: English
ECTS Credits: 1
Tutorial Hours: 13.5

Presentation and intended learning outcomes

The aim of this module is to:

- improve their knowledge of the world of practice
- support the students in the construction of their professional project
- provide toolkit for internship and job search tools and techniques
- promote the success of the internship period
- develop the skills to integrate and evolve throughout their professional career

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

- develop and improve self-awareness
- get prepared physically, intellectually, and mentally for interviews
- improve behaviour and communication style

Prerequisite

None.

UE13: INTERNSHIP

Semester: 2
Language: English
ECTS Credits: 2

Presentation and intended learning outcomes

Students are required to do an internship of 2 months (at least 3 months is highly recommended) starting in April (after the exam session). During the internship students are supposed to participate to the activities of investment funds, investment banks or retail banks, or to work in the finance department of companies. Students can also set up their own firm.

By the end of the internship students should be able to:

- integrate academic theory with practical experience in a professional field of interest
- develop content specific and transferable skills

- synthesize information in written and oral form
- establish mentoring relationships with professionals in a career field of interest
- build a professional network
- respect and integrate the opinion of others
- work effectively in team

Prerequisite

Basic knowledge studied in the M1 classes.