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 decision. 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

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:

- recognize key financial indicators from financial statements
- identify appropriate financial criteria for corporate valuation and investment decisions
- calculate the value implications of investment decisions

**Prerequisite**

Accounting basics.

**Bibliography**


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

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 e.g. 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)

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

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 analyze firm’s decisions by applying principles of economic analysis. Using the rational behavior 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 analyze situations of strategic interaction (game theory)
- solve simple problems of strategic interaction
- appraise how firms interact strategically in product markets

Prerequisite

Basic Mathematical knowledge

Bibliography

- Introduction to Industrial Organization, L. Cabral, M.I.T. Press
- The Economics of Strategy, D. Besanko, Wiley editor

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 analyze financial statements
- describe and apply some basic international accounting standards

Prerequisite

General accounting background.

Bibliography

- Vernimmen, Corporate Finance: Theory and Practice, John Wiley & Sons Inc.
- IAS Plus Website

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 faster 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. This is what is research. This course is a first research-course oriented at the Master level and provide an opportunity for students to establish your understanding of research through critical exploration of research language, ethical principles and challenges, and the elements of a research design.

Participating in Introduction to Research in Finance will allow you to:

- Understand research terminology;
• Discover to critically review literature relevant to your field or interests;
• Determine how research findings are useful in forming your understanding of your work;
• Design a project which tests essential frameworks, and which enables modelling of key theories;
• Develop a research methodology which enables accurate representation of key themes and ideas within the field of finance;
• Be aware of the ethical principles of research, ethical challenges and approval processes.
• Engage with like-minded peers to take control of your own research plans and ideas

Prerequisite
None.

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

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

• Derivatives Markets (3rd edition), by Robert L McDonald.
• Options, Futures and Other Derivatives (11th edition), by John C Hull.

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 will provide 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, derivatives), 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

Prerequisite

None.

Bibliography

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

UE8: PRINCIPLES OF CORPORATE FINANCE

Semester: 2
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

Prerequisite

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

Bibliography


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 for students in Master 1 Finance. 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 class in Master 2. The emphasis will be put on intuitive understanding of concepts and will introduce 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

**Prerequisite**

Basic probability and statistical concepts. Linear algebra.

**Bibliography**


**UE10-1: INFORMATION TECHNOLOGY FOR FINANCE (EXCEL FOR FINANCE)**

Semester: 2
Language: English
ECTS Credits: 1.5
Tutorial Hours: 18

**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 the NPV and the 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

**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)
- Excel modeling and estimation in the fundamentals of corporate finance - Craig W. Holden (Pearson/Prentice Hall)

UE10-2: 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 Application 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.

UE10-3: INFORMATION TECHNOLOGY FOR FINANCE (DATABASES)

Semester: 2  
Language: English  
ECTS Credits: 1.5  
Tutorial Hours: 12

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

Prerequisite

Computer basics, office tools.

Bibliography


**UE11-1: PROFESSIONALISATION (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 project and define the milestones to achieve the objectives
- plan and use adequate methods to conduct qualified tasks in given frameworks
- build team spirit, presentation and technical writing skills
- interpret analysis results and make recommendations with valid justifications for actions
• 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.

UE11-2: PROFESSIONALISATION (PROFESSIONAL DEVELOPMENT)

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

Presentation and intended learning outcomes

The Preparation for entering the workforce programme helps students at working on soft skills. The programme is organized in four workshops.

The Self-awareness and knowing your talents workshop aims at:
• Optimizing your talents and resources through improved self-awareness.

The Creating your personal career plan workshop aims at:
• Improving your knowledge of the working world.
• Creating your personal career plan.

The Learn how to look for internships, prepare for interviews, and how to get on in the workplace workshop aims at:
• Optimizing your internship search: Targeted research, tailor your CV, look in the right places.
• Preparing yourself physically, intellectually, and mentally for interviews and starting your internship, know how to sell yourself.

The Capitalizing on your image and communication style workshop aims at:
• Refining your image and optimize your talents through your behaviour and communication style.

By the end of this course, students should be able to:
• develop and improve self-awareness
• improve their knowledge of the working world
• create a career plan
• optimize internship search
• get prepared physically, intellectually, and mentally for interviews
• improve behaviour and communication style

Prerequisite

For the Creating your personal career plan workshop: think about what types of job you are interested in before the workshop. For the Learn how to look for internships, prepare for interviews, and how to get on in the workplace workshop: prepare your CV in advance, look
into companies that are hiring and the type of internship you are looking for. For the
Capitalising on your image and communication style workshop: know your MBTI profile, come
dressed for an interview

**UE11-3: PROFESSIONALISATION (INTERNSHIP)**

**Semester:** 2  
**Language:** English  
**ECTS Credits:** 2

**Presentation and intended learning outcomes**

Students are required to do an internship of 2 months (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.

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

- integrate academic theory with practical experience in a professional field of interest
- clarify career goals
- develop content specific and transferable skills
- establish mentoring relationships with professionals in a career field of interest
- build a professional network

**Prerequisite**

Basic knowledge studied in the M1 classes.