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Number of ECTS credits : 4 Faculty :

Facult

### $\equiv$ course description

This module aims at addressing the key aspects of business valuation in the current economic climate. The first part focuses on the contexts of evaluation, the main methods and the importance of the evaluation process. An important part is devoted to the cost of capital and the components of various sources of capital. It is then possible to present the main evaluation methods and implement them in practical examples and actual case studies. Some case studies are carried out by professionals. The final session will open the debate through a reflection on the contributions and limitations of the method of real options.

# $\equiv$ course objectives

At the end of this module, students should be able to:

- Compute the WACC and its components
- Use different techniques to value a firm
- Understand, search-seek and extract relevant information from various data sources
- Extract Information from the main financial statements
- Update and Adjust current figures
- Estimate Discount Rates
- Estimate Cash Flows
- Estimated Discount Rates
- Decide on what is the most appropriate evaluation for different companies
- Develop a group report

# $\equiv$ LEARNING GOALS

# $\equiv$ TACKLED CONCEPTS

- Discount Rates
- o Cost of Equity
- o Cost of Debt
- o WACC
- Estimate Cash Flows
- o Measure and Update Earnings
- o From Earnings to Cash Flows
- Estimate Growth
- o Stable
- o 2-stage Growth Models
- o 3-stage Growth Models
- Relative Valuation
- o Earnings Multiples
- o Book Value Multiples
- o Sales Multiples
- Real Options
- o Option to Expand
- o Option to Abandon
- o Option to Delay
- o Equity as an option to liquidate

# ■ LEARNING METHODS

10 x 3 hour lectures will be used to introduce new material and to expand areas of financial theory but much of the learning will be done through case study work. Students will be required to analyse a situational problem and to put forward a solution for discussion.

# **≡** ASSIGNMENTS

Mid-term exam : Group Coursework 30% of the final mark Final Exam : Written Exam, 70% of the final mark, open book, calculator needed

For the group project, you will know your group and group members by the end of the first week of the module.

Late submissions will be penalized by 10%/day (max 30%) reduction of the final grade.

# **∃** BIBLIOGRAPHY

Damodaran on Valuation, Willey, 2nd edition http://www.scholarvox.com/reader/index/docid/10051129/searchterm/damodaran Investment Valuation, A. Damodaran, Willey, 2nd edition Corporate Finance, European edition, HILLIER et al., 2010

# $\equiv$ EVALUATION METHODS

**30 % :** Team Project (presentation and report) **70 % :** Examen final

# $\equiv$ sessions

1	Introduction LECTURE : 03h00
2	DCF I LECTURE : 03h00
	- Discount Rates o Cost of Equity o Cost of Debt o WACC o Case Studies
3	DCF II LECTURE : 03h00
	- Estimate Cash Flows o Measure and Update Earnings o From Earnings to Cash Flows o Case Studies
4	DCF III LECTURE : 03h00
	- Estimate Growth o Stable o 2-stage Growth Models o 3-stage Growth Models
5	DCF case studies LECTURE : 03h00
	- DCF Examples - Complete Case Studies – Full Valuations
6	Relative valuation LECTURE : 03h00
	- Introduction to Relative Valuation o Earnings Multiples o Book Value Multiples o Sales Multiples
7	Relative valuation case studies LECTURE : 03h00
	- Relative Valuation and DCF Examples - Complete Case Studies – Full Valuations

LECTURE: 03h00

- Introduction to Real Options

- o Option to Expand
- o Option to Abandon
- o Option to Delay

### **Real options case studies** 9

### LECTURE:03h00

- Equity as an option to liquidate

- Real Option, Relative Valuation and DCF Examples - Complete Case Studies - Full Valuations

### **Recoup and Revision** 10 LECTURE: 03h00

Faculty :

### $\equiv$ course description

The course deals with the theory and the application of portfolio management techniques.

The aim is to survey the major theories, tools and results in portfolio management.

As the course emphasizes not only the theory, but also its practical application, by the end of this course, students are expected to have a good understanding of the asset management market, the financial instruments, and the market practitioners' terminology.

In addition, they should be able to develop a fair knowledge and understanding of key issues in asset allocation and portfolio composition and management and to implement adequate portfolio management strategies.

The course is designed to cover most of the "Portfolio Management and Wealth Planning" topic area and many concepts of some of the other topic areas of the CFA Candidate Body of Knowledge.

# $\equiv$ course objectives

The main objective of this course is to learn the key theory with practical applications relevant to portfolio management. After completing this course students will be able to:

- Measure and manage portfolio risk and return

- Select and monitor an investment and build a portfolio

- Practically understand and apply asset pricing basics

# ⊟ LEARNING GOALS

# **∃** TACKLED CONCEPTS

Portfolio mathematics Risk - return - utility functions Asset pricing models Index models Portfolio performance evaluation Passive and active portfolio management Allocation of funds to portfolios

# ■ LEARNING METHODS

Lectures Practical lab applications Team project Homework and self-assessed work Classroom discussion

# **≡** ASSIGNMENTS

Mid-term exam Group coursework

## **∃** BIBLIOGRAPHY

Z. Bodie; A. Kane; A.J. Marcus, Investments. McGraw-Hill International

# **≡** EVALUATION METHODS

**30 % :** Continuous assessment **70 % :** Examen final

### $\equiv$ sessions

1	Introduction: the asset management industry LECTURE : 03h00
	This session offers a description of the course (aims and objectives, teaching and learning methods, topics to be covered, class rules) and provides an introduction to the asset management industry.
2	Quantitative tools for portfolio management LECTURE : 03h00
	This session is devoted to a review of the quantitative tools: the basics of return calculation, a review of basic statistics, regression analysis, and matrix algebra.
3	The mean-variance framework LECTURE : 03h00
	This session introduces the concepts of return and risk as the main inputs of any asset allocation strategy and highlights the advantage (and the drawbacks) of using expected returns and variance of returns as the only indicators of return and risk. It also shows how individuals' preferences can be represented in such a mean-variance framework.
4	Portfolio Selection: the theory LECTURE : 03h00
	This session presents the Markowitz's model and shows how to build the optimal portfolios by using (i) 2 risky assets; (ii) a risky asset and a riskless one; (iii) n risky assets; (iv) n risky assets and a riskless one. It also shows how investor's preferences enter the portfolio selection.
5	Portfolio Selection: MS Excel application LECTURE : 03h00
	This session completes the previous one by showing how to generate the efficient frontier of financial portfolios using real data on Excel. The quadratic optimization approach (through Excel solver) is discussed.
6	CAPM and index models LECTURE : 03h00
	In this session the Capital Asset Pricing Model, a centerpiece of the modern financial economics, is introduced and discussed critically. This session also introduces the index models (single-index and multi-index models), their advantages and limitations, how to estimate them and how to interpret this information. Practical examples of index model applications are presented and the link between the market model and the CAPM is discussed.
7	APT and multifactor models of risk and return LECTURE : 03h00
	In this session the Arbitrage Pricing Theory is outlined. The Fama-French multifactor model of risk and return is introduced and compared to the standard CAPM.
8	The frontiers of portfolio diversification LECTURE : 03h00
	This session illustrates the benefits of a portfolio diversification across different markets, sectors, and different asset classes. An analysis of the main alternative asset classes is provided.
9	Practical issues in portfolio management (I) LECTURE : 03h00
	This session deals with some practical issues in portfolio management: the rationale of the existence of different mutual funds, the need for benchmarks, the costs and benefits of two alternative investment approaches (active vs passive portfolio management), the performance evaluation measures (risk adjusted measures such as the Sharpe ratio, the Treynor ratio, the Jensen's alpha, the appraisal or information ratio are presented).

This session completes the previous one as it deals with the performance analysis of mutual funds and shows the standard approaches to decompose performances and identify investment styles. It also discusses the modern portfolio management process and its ethics as well as the different stages of the portfolio process. Finally, it deals with the remuneration of the asset management activity, through an analysis of the management fees and the mutual funds' expense ratios.

Number of ECTS credits : 4 Faculty :

### $\equiv$ course description

After completing this course you will be able to:

- Modelling future financial environment
- Create models of asset valuation and derivatives
- Calculate all the parameters of position risk / portfolio
- Establish arbitrage strategies
- Use the tools in the trading room
- Develop tools alert

### $\equiv$ course objectives

The objective of this course is to understand the business of trading in financial markets: market maker, manager on own account or Hedge Fund Manager

## LEARNING GOALS

### **∃** TACKLED CONCEPTS

Concepts taught:

- Curves of expected returns
- Risk Premiums
- Statistical Tools
- Probabilistic models
- Determinants and sensitivities
- Duration of assets
- Arbitration vs Active Active
- Arbitration vs Active Derivatives
- Arbitration vs Derivatives Derivatives
- Calculate P & L
- Risk Management

### **≡** LEARNING METHODS

Case Study, Setting, Personal research

### $\equiv$ ASSIGNMENTS

Personal work before each session

### **∃** BIBLIOGRAPHY

Options, Futures, and Other Derivatives, John C. Hull, Ninth Edition (ISBN: 978-0-13-345631-8)

### $\equiv$ EVALUATION METHODS

60 %: Examen final

### $\equiv$ sessions

1

reminders LECTURE:03h00

Curves of expected returns, risk premiums and financial calculations

2	Statistical Tools LECTURE : 03h00
3	Probabilistic models LECTURE : 03h00
4	Determinants and sensitivities LECTURE : 03h00
5	Duration of assets LECTURE : 03h00
6	Arbitrage Actif vs Actif LECTURE : 03h00
7	Arbitrage Actif vs Derivatives LECTURE : 03h00
8	Arbitrage Derivatives vs Derivatives LECTURE : 03h00
9	Calculate P & L LECTURE : 03h00
10	Risk Management LECTURE : 03h00

Number of ECTS credits : 4 Course language : English Faculty :

# $\equiv$ course description

The aim of this course is to give knowledge to students about default risk and skills to assess it. Students will apply credit scoring techniques used in the banking industry as well as within companies to assess borrowers' risk of default. Laptops are more than welcome as students will extensively use Excel and R softwares.

Prerequisites for this course:

- Financial analysis course (basic level, such as the one offered in Semester 3 of the Grande Ecole programme)
- Basic math, probability theory & statistics

A brief reminder of these topics will take place within the course.

# $\equiv$ course objectives

Upon completion of the module, you should have:

- advanced knowledge and critical understanding in rating, scoring and data mining techniques applied in the banking & corporate industry
- · demonstrated ability to exercise critical judgment on complex situations
- used highly specialized and advanced technical, professional and academic skills in the analysis of relevant specific problems in finance, and in modeling default risk
- the ability to assess a company's financial position and risk of bankruptcy through a solid and detailed analysis of its financial statements, business environment, strategy and financing decisions

# ⊟ LEARNING GOALS

## **∃** TACKLED CONCEPTS

Default risk

Rating

Scoring

Covenant package

Technical default & insolvency

Data mining techniques used in bankruptcy prediction

### **≡** LEARNING METHODS

Case studies

Numerical applications

Softwares used in this class:

- Excel (extensively used)
- R an open statistical software (used for sessions on predicting default risk)

### $\equiv$ ASSIGNMENTS

Both formative (in class) and summative (final exam) assessments.

100% of the final grade is assessed by an individual final exam (closed books, 1 non programmable calculator authorized)

### BIBLIOGRAPHY Ξ

Damadoran, A. Corporate Finance: Theory and Practice. John Wiley & sons

Tan, P. N., Steinbach M., Kumar V. Introduction to data mining. Pearson

# $\equiv$ EVALUATION METHODS

30 %: Team Project (presentation and report) 70%: Individual Written Assignment

# **≡** SESSIONS

1

Part I: Default risk assessment & prevention (1/2) LECTURE: 03h00

### Homework:

Not compulsory, only if you are not familiar with financial statements:

Damodaran: Corporate Finance, Chapter 4, p. 94 to 141

Credit Engineering for Bankers, Chapter 3, p. 63-83

### Rating methodology

- Analyzing a business profile
- Determining a financial profile

Illustration: Manpower (Excel)

2

### Part I: Default risk assessment & prevention (2/2) LECTURE: 03h00

### Homework:

Lecture – Mezzanine Financing: Chapters 10 to 10.4, p. 313-321

### Scoring methodology

Illustration: Bank scoring (Excel)

Credit risk impact on issuers: spread & covenant package

### Part II: Going bankrupt LECTURE: 03h00

Part II: Going bankrupt

Homework:

Findus group case study preparation - Try to answer to all questions.

Case study: How junior lenders took-over the control of Findus group (Excel)

### Homework:

Matrix algebra

Formative assessment:

Matrix algebra

Linear regression classifier

	Linear regression classifier applied to predict bankruptcy (Excel)
5	Part III: Predicting bankruptcy risk (2/6) LECTURE : 03h00
	Homework:
	Bayes rule
	Formative assessment:
	Bayes rule
	Naïve bayes classifier
	Naïve bayes classifier applied to predict bankruptcy
6	Part III: Predicting bankruptcy risk (3/6) LECTURE : 03h00
	Formative assessment:
	LDA
	Linear discriminant analysis applied to predict bankruptcy.
	Altman z-score
7	Part III: Predicting bankruptcy risk (4/6) LECTURE : 03h00
	Formative assessment:
	Logistic regression
	Logistic regression analysis applied to predict bankruptcy.
	AIC criteria
	ROC curves

8	Part III: Predicting bankruptcy risk (5/6) LECTURE : 03h00
	Homework:
	Classification: Basic concepts, decision trees, and model evaluation
	Formative accossment:
	Decision trees
	Introduction to decision trees
9	Part III: Predicting bankruptcy risk (6/6) LECTURE : 03h00
	Applications with R.
10	Part IV: Optimal capital structure LECTURE : 03h00
	Homework:
	Damodaran A., Corporate Finance – Chapters 15 & 17
	Capital structures: models and applications

Faculty :

### $\equiv$ course description

This module aims to provide students with the necessary training to develop an advanced understanding of derivatives and commodities.

## $\equiv$ course objectives

Upon completion of the module, you should have:

- specialist knowledge of the different types of derivative instruments
- describe the investment and risk characteristics of derivatives
- an in depth knowledge of the uses and functionality of derivative products, and be able to calculate the underlying value of such products

# **≡** LEARNING GOALS

### ■ TACKLED CONCEPTS

Traditional options Traded options Hedge ratio Call/put parity Black & Scholes model Binomial model Greeks Commodities

### **≡** LEARNING METHODS

Presentation Readings Exercises

## **≡** ASSIGNMENTS

**Readings & exercises** 

### **∃** BIBLIOGRAPHY

"Options, Futures, and Other Derivatives", John C. Hull, Pearson Education

# **≡** EVALUATION METHODS

100 %: Examen final

### $\equiv$ sessions

1

Session 1 LECTURE : 03h00

Futures markets

2	Session 2 LECTURE : 03h00
	Basics in derivatives Call/put parity

3	Session 3 LECTURE : 03h00
	Derivatives' valuation: Binomial trees Binomial model
4	Session 4 LECTURE : 03h00
	Derivatives' valuation: Black & Scholes model
5	Session 5 LECTURE : 03h00
	Estimating derivatives' risk: Greek letters
6	Session 6 LECTURE : 03h00
	Derivatives' trading strategies Hedging with derivatives
7	Session 7 LECTURE : 03h00
	Estimating volatility
8	Session 8 LECTURE : 03h00
	Value at risk
9	Session 9 LECTURE : 03h00
	Swaps valuation Derivative Swaps: Swaptions
10	Session 10 LECTURE : 03h00
	Commodities

Faculty :

### $\equiv$ course description

The first part of the course covers credit derivatives (both single-name and structured products) and the market pricing of credit risk. The second part of the course deals with the measurement of market risk (Value at Risk, Expected Shortfall) in portfolios of financial assets.

# $\equiv$ course objectives

The course aims at providing a technical and hands-on approach to credit risk and market risk measurement. At the end of the course students should be able to extract information on the credit quality of an entity from market prices of bonds and credit derivatives. In addition, they should be able to estimate the market risk of a portfolio of assets in terms of Value at Risk and Expected Shortfall.

# ■ LEARNING GOALS

### TACKLED CONCEPTS

Financial concepts:

Credit risk and credit derivatives. Market pricing of credit risk. Structured credit products. Market risk measures: Value at Risk and Expected Shortfall.

Technical tools:

Multivariate distributions. Principal component analysis. Historical (non-parametric) simulation. Monte Carlo simulation. Bootstrapping techniques and calibration. Poisson default processes. Correlation modeling.

## **≡** LEARNING METHODS

Standard Lectures. Exercises. Computer-based applications.

## $\equiv$ ASSIGNMENTS

One mid-term group empirical assignment (groups of 5 students) The mid-term assignment accounts for 30% of the final grade. The final exam (exercises and open questions) accounts for the remaining 70% of the grade.

### ≡ BIBLIOGRAPHY

Textbook: "Options, Futures, and Other Derivatives", John C. Hull, Pearson Education

"Risk Management and Financial Institutions", John C. Hull, Wiley. Primary reading material: Instructor's slides, exercise sets, programming examples.

## $\equiv$ EVALUATION METHODS

**30 % :** Team Project (presentation and report) **70 % :** Individual Written Assignment

## $\equiv$ sessions

1

### Credit risk components

LECTURE: 03h00

Credit risk. Credit risk components: Country risk, sector risk, firm-specific risk. Recovery rates. Credit risk and the business cycle.

### 2 Market measures of credit risk LECTURE : 03h00

Market measures of credit risk: Bond yields and credit default swap spreads. An introduction to credit derivatives.

3	Credit default swaps LECTURE : 03h00
	Credit default swaps pricing: The asset swap approach and the full valuation approach.
4	Reduced-form models of credit risk LECTURE : 03h00
	Default-intensity or reduced-form models. Bootstrapping default probabilities from CDS spreads and bond prices. Liquidity risk premium.
5	Structured credit products LECTURE : 03h00
	Default correlation and structured credit products: Mortgage-backed securities, Collateralized debt obligations, asset-backed securities. Structured products mispricing in the financial crisis.
6	Market risk LECTURE : 03h00
	Market risk. Dimension reduction techniques. Principal component analysis and applications.
7	Value-at-Risk: parametric LECTURE : 03h00
	Value at risk. Parametric approach: volatility and correlation estimation.
8	Value-at-Risk: non-parametric LECTURE : 03h00
	Value at risk. Simulation approaches: Historical simulation and Monte Carlo simulation.
9	Expected Shortfall LECTURE : 03h00
	Beyond Value at risk: Expected shortfall. Backtesting and stress-testing of VaR and ES.
10	Regulation LECTURE : 03h00
	Market risk and credit risk regulatory developments. Counterparty risk.

Faculty :

## $\equiv$ course description

The course focuses on selected core aspects of international economics and finance. The first part of the course creates a needful basis for understanding the fundamental features of international trade and financial transactions in a broader macroeconomic context. The second part of the course goes more in details in terms of analyzing the structure and basic tools of foreign exchange and money markets.

# **≡** COURSE OBJECTIVES

Upon successful completion of this course, students will be able to:

- understand the basic theoretical models of international trade;

- understand the way how exchange rates are managed and determined on international markets;
- understand the substance of international trade and capital flows;
- use the balance of payments for fundamental macroeconomic analysis and predictions;
- understand the main features of foreign exchange and money markets;
- apply basic theoretical relations in foreign exchange rates and interest rates forecasting;
- use interest rate and currency derivatives for hedging, speculations and arbitrages.

# $\equiv$ LEARNING GOALS

## **∃** TACKLED CONCEPTS

Classical and Neoclassical Theory Keynesianism Monetary Approach International Parity Conditions

## **≡** LEARNING METHODS

The course combines lectures, exercises, case studies and discussions on actual problems.

# **≡** ASSIGNMENTS

3 mini cases Project Exam

Students will be graded on the basis of: doing the series of mini cases during the term (20 %), presentation of the project (40 %), written exam on literature and class handouts (40 %). Final grade depends on total number of percent (see bellow):

```
1 (excellent) = 90 - 100 %
2 (very good) = 75 - 89 %
3 (good) = 60 - 74 %
4+ (fail) = 50 - 59 % (it is possible to repeat the written exam)
4 (fail) = 59 % and less
```

# **∃** BIBLIOGRAPHY

KRUGMAN, P R. -- OBSTFELD, M. International economics : theory & policy. Boston: Pearson, 2009. ISBN 978-0-321-55398-0. EITEMAN, D K. -- STONEHILL, A I. -- MOFFETT, M H. Multinational business finance. Boston: Prentice Hall, 2010. ISBN 978-0-13-609668-9.

# **≡** EVALUATION METHODS

**60 % :** Contrôle continu 20% + Team Project 40% **40 % :** Individual Written Assignment

# $\equiv$ sessions

1	International Trade Theories 1 LECTURE : 03h00
	Mercantilism; Classical and neoclassical theories; Monetarism, Keynesian theory, protectionist theories; Standard trade model.
2	International Trade Theories 2 LECTURE : 03h00
	Mercantilism; Classical and neoclassical theories; Monetarism, Keynesian theory, protectionist theories; Standard trade model.
3	Exchange rate economics 1 LECTURE : 03h00
	Exchange rate regimes; Purchasing power parity (absolute and relative version); Uncovered interest rate parity condition; Monetary approach to exchange rates.
4	Exchange rate economics 2 LECTURE : 03h00
	Exchange rate regimes; Purchasing power parity (absolute and relative version); Uncovered interest rate parity condition; Monetary approach to exchange rates.
5	Balance of payments statement LECTURE : 03h00
	Foreign transaction in balance of payments; Balance of payments structure; Current account balance, financial account balance and changes in official reserves; Balance of payments theory.
6	Foreign exchange and money markets LECTURE : 03h00
	Structure of FX and money markets, OTC market, main participants, main transactions, motivation, exchange rate and interest rate quotations;
7	Interest rate and currency derivatives 1 LECTURE : 03h00
	Outright forwards, technique of transaction, hedging, speculations, arbitrages; Swaps, technique of transaction, main type of swaps, swaps and management of risks.
8	Interest rate and currency derivatives 2 LECTURE : 03h00
	Outright forwards, technique of transaction, hedging, speculations, arbitrages; Swaps, technique of transaction, main type of swaps, swaps and management of risks.

9

Futures, technique of transaction, daily settlement, clearing house, futures and hedging and speculation; Options, technique of transaction, exchange and OTC; options, option position and profit or lost, call and put option; Exotic options - Cap, Floor, Collar.

### **10** Interest rate and currency derivatives 4 LECTURE: 03h00

Futures, technique of transaction, daily settlement, clearing house, futures and hedging and speculation; Options, technique of transaction, exchange and OTC; options, option position and profit or lost, call and put option; Exotic options - Cap, Floor, Collar.