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MSC_CFIB511
VALUATION TECHNIQUES

Number of ECTS credits : 3 **Course language** : English
Course leader : BAZIH Jad
Speakers : AVERSA Bastien
Term: FALL

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.

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

TACKLED CONCEPTS

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

LEARNING METHODS

24 hours face to face
Lectures
Case studies discussion
In class tutorials and practical exercises

EXPECTED WORK AND EVALUATION

Group Assignment: 30% of the final mark
Final Exam : 70% of the final mark

BIBLIOGRAPHY

Damodaran, A. (2006). *Damodaran on valuation : security analysis for investment and corporate finance* . (2e éd.). Wiley. EBOOK
Damodaran, A. (2012). *Investment valuation : tools and techniques for determining the value of any asset* . (3e éd.). Wiley. EBOOK
Berk, J., DeMarzo, P. (2024). *Corporate finance*. (6th global ed.). Pearson. EBOOK
Bodie, Z., Kane, A., Marcus, A-J. (2024). *Investments*. (13th ed.). McGraw-Hill. EBOOK

EVALUATION METHODS

30 % : Continuous assessment
70 % : Final exam

SESSIONS

1

Introduction

LECTURE : 02h00

2

Discount rates: Cost of Equity, Cost of Debt, WACC

LECTURE : 02h00

•Sources of Capital
•Component Costs
•WACC
•Adjusting for Flotation Costs

3

Estimate Cash Flows 1: Measure and Update Earnings, From Earnings to Cash Flows – FCFF

LECTURE : 02h00

- DCF Approaches
- FCFF

4

Estimate Cash Flows 3: Measure and Update Earnings, From Earnings to Cash Flows – FCFE

LECTURE : 02h00

5

Estimate Cash Flows 4: Measure and Update Earnings, From Earnings to Cash Flows - Growth

LECTURE : 02h00

- Growth estimations using different methods

6

DDMs: Stable, 2-stage Growth Models, 3-stage Growth Models

LECTURE : 02h00

- DDM Principles
- Growth Stages
- Feasibility of DDM

7

DDMs: Complete Case Studies - Full Valuations

LECTURE : 02h00

8

Relative Valuation: Earnings Multiples, Book Value Multiples, Sales Multiples

LECTURE : 02h00

- *Definition*
- *Pros v Cons*
- *Deconstructing Multiples*
- *PE ratio analysis*

9

Relative Valuation and DCF Examples, Complete Case Studies, Full Valuations

LECTURE : 02h00

10

Real Options: Option to Expand, Option to Abandon, Option to Delay

LECTURE : 02h00

11

Equity as an option to liquidate. Real Option, Relative Valuation and DCF Examples

LECTURE : 02h00

12

Revision+ Assessment

LECTURE & PRACTICAL WORK : 02h00

MSC_CFIB512
PRIVATE EQUITY

Number of ECTS credits : 3
Course language : English
Course leader : BAZIH Jad
Speakers : VINATIER Vincent
Term: FALL

COURSE DESCRIPTION

Private equity (PE) is crucial in developing new business ventures and promoting innovation. This course investigates how PE firms operate, analysing the key strategic issues they face during the fundraising, investing and exit stages of the PE cycle. Topics covered include: the determinants and types of PE fundraising, the organisational structure of PE firms, the PE firm's investment decision, the PE firm-investee company relationship and the design of exit strategies. The role of PE in the broader economy is also discussed. Finally, we introduce some of the ethical issues PE firms face.

COURSE OBJECTIVES

At the completion of this unit, you should be able to:

- demonstrate skills in oral and written communication
- demonstrate skills in problem solving
- demonstrate critical thinking
- understand the different elements of the PE/VC cycle
- understand the nature of the strategic relationship between venture capitalists, entrepreneurs and investors
- identify possible private equity investment opportunities and explain how they may be implemented
- understand the role of government and regulation in the private equity industry
- understand the role of private equity in innovation
- become sufficiently informed to confidently participate in public policy discussions on the impact of the private equity industry.

TACKLED CONCEPTS

- **Private Equity and Venture Capital Lifecycle**: Understanding the stages from fundraising to exit strategies.
- **Strategic Relationships**: Exploring dynamics between VCs, entrepreneurs, and investors.
- **Investment Identification**: Techniques for spotting and implementing PE investment opportunities.
- **Innovation and Impact**: Analyzing PE's role in fostering innovation and influencing market dynamics.

LEARNING METHODS

24 hours face to face
Lectures
Case studies discussion
In class tutorials and practical exercises

EXPECTED WORK AND EVALUATION

Class Assignment: 30% of the final mark
Final Exam : 70% of the final mark

BIBLIOGRAPHY

Cendrowski, H., Martin, J-P., Petro, L-W., Wadecki, A-A. (2008). *Private equity : history, governance, and operations*. Wiley. + EBOOK

Witney, S. (2021). *Corporate governance and responsible investment in private equity* . Cambridge University Press. EBOOK

EVALUATION METHODS

30 % : Continuous assessment
70 % : Final exam

SESSIONS

1 **Introduction to Private Equity**
LECTURE : 02h00

- Overview
- PE fund types

PE vs other asset classes

2 **Company Valuation Refresher**
LECTURE : 02h00

3 **Leverage Buyouts (LBOs)**
LECTURE : 02h00

4 **Case Study: Toys'R'Us**
LECTURE & CASE STUDIES : 02h00

5 **The LPA agreement and PE remuneration structures**
LECTURE : 02h00

6 **The Private Equity Lifecycle - Fundraising The Private Equity Lifecycle – Sourcing and Investing**
LECTURE : 02h00

7 **Case Study: Worldpay**
PRACTICAL WORK : 02h00

8 **The Private Equity Lifecycle – Managing The Private Equity Lifecycle – Harvesting (exit)**
LECTURE : 02h00

9 **Regulatory, political and sustainability considerations**
LECTURE : 02h00

10 **Current state of PE, cyclical considerations**
LECTURE : 02h00

11 **Ecosystem Case Study: Partners Group**
LECTURE : 02h00

12 **Evaluation**
PRACTICAL WORK : 02h00

MSC_CFIB513
MERGERS & ACQUISITIONS

Number of ECTS credits : 3
Course language : English
Course leader : BAZIH Jad
Speakers : AVERSA Bastien
Term: FALL

COURSE DESCRIPTION

This course covers the broad field of mergers, acquisitions, and divestitures. The primary objective of the course is for each student to gain a well-rounded understanding of the major strategic, economic, financial, and governance issues of mergers and acquisitions.

COURSE OBJECTIVES

At the completion of this course, students should be able to:

- Examine the role that M&A plays in the contemporary corporate world, and its use as a strategic tool to provide growth, enhance competitive position, transform a company or industry, and create shareholder value
- Analyze transactions including understanding strategic rationale, valuation methodologies, deal structures, bidding strategies, and the need for a value proposition
- Understand how M&A can be used successfully as well as its pitfalls, dangers and risks

TACKLED CONCEPTS

M&A Strategy
Deal Structures
Shareholder Value Creation
Post-Merger Integration
Risk Management in M&A

LEARNING METHODS

24 hours face to face
Lectures
Case studies discussion
In class tutorials and practical exercises

EXPECTED WORK AND EVALUATION

Assignment: 30% of the final mark
Final Exam : 70% of the final mark

BIBLIOGRAPHY

Applied Mergers and Acquisitions, by Robert F. Bruner, University Edition (Wiley, 2004).

EVALUATION METHODS

30 % : Continuous assessment
70 % : Final exam

SESSIONS

1 **Review of M&As; Drivers of Mergers; Merger Proxy Statement**
LECTURE : 02h00

2	**Ethics in M&As; Do M&As pay?; Cross-border M&As** LECTURE : 02h00
3	**Strategy; Acquisition search; Due diligence** LECTURE : 02h00
4	**Valuation approaches; Valuing synergies** LECTURE : 02h00
5	**Valuing high levered deals; valuing liquidity and control** LECTURE : 02h00
6	**Deal structuring** LECTURE : 02h00
7	**Post-merger management issues** LECTURE : 02h00
8	**Governance in M&As** LECTURE : 02h00
9	**Legal framework; Negotiation issues** LECTURE : 02h00
10	**Hostile takeovers; takeover defences** LECTURE : 02h00
11	**Review** LECTURE : 02h00

MSC_CFIB521
CORPORATE FINANCE

Number of ECTS credits : 3
Course language : English
Course leader : BAZIH Jad
Speakers : HONSEL Tiphaine
Term: FALL

COURSE DESCRIPTION

This course introduces foundational concepts in capital markets and corporate finance, equipping students for further studies in the discipline. The firm and the role of financial institutions are explored before developing important skills in financial mathematics. The course then moves to the valuation of tradable securities and their pricing in the capital markets. The decisions firms make around capital structure and payout policy are studied. The course concludes with an exploration of information and market efficiency. The tools of finance allow decision makers to navigate risk and uncertainty.

COURSE OBJECTIVES

At the completion of this unit, you should be able to:

- Compute the risk-adjusted present value and future value of single cash flow streams, mixed cash flow streams, annuities and perpetuities
- Understand the contemporary institutional environment of financial markets and key participants.
- Discuss and explain the relationship between various measures of risk and return and apply the Capital Asset Pricing Model (CAPM).
- Discuss and explain the concept of market efficiency and the role of information in financial markets.
- Value bonds and stocks through the principles of valuation.
- Solve capital budgeting problems and describe and integrate them into practical considerations.
- Explain the impact of investment, financing and dividend decisions on firm value.
- Apply and integrate key financial concepts to real-world problems.
- Operate and contribute in a team-based structure.

TACKLED CONCEPTS

Financial mathematics; Assessment of risk and return; financial decision making; valuation and pricing of instruments; information and market efficiency.

LEARNING METHODS

24 hours face to face
Lectures
Case studies discussion
In class tutorials and practical exercises

EXPECTED WORK AND EVALUATION

Class Assignment: 30% of the final mark
Final Exam : 70% of the final mark

BIBLIOGRAPHY

Titman, S., Keown, A-J., Martin, J-D. (2021). *Financial management : principles and applications*. (14th global ed.). Pearson. EBOOK

EVALUATION METHODS

30 % : Continuous assessment
70 % : Final exam

SESSIONS

1 **Introduction**
LECTURE : 02h00

2 **Financial Mathematics 1**
LECTURE : 02h00

Time value of money

3 **Financial Mathematics 2**
LECTURE : 02h00

Annuities

4 **Valuation of stocks and bonds**
LECTURE : 02h00

5 **Capital budgeting 1 : Investment decision criteria**
LECTURE : 02h00

Investment decision criteria

6 **Capital budgeting 2 : Project cash flows**
LECTURE : 02h00

Project cash flows

7 **Risk and return; Market efficiency**
LECTURE : 02h00

8 **The capital asset pricing model (CAPM)**
LECTURE : 02h00

9 **Company cost of capital**
LECTURE : 02h00

10 **Capital structure policy and Dividend policy**
LECTURE : 02h00

11 **Sustainable Investing, Circular Economy Finance**
LECTURE : 02h00

12 **Review**
LECTURE : 02h00

MSC_CFIB522
PORTFOLIO MANAGEMENT

Number of ECTS credits : 3
Course language : English
Course leader : BAZIH Jad
Speakers : LANDRON Etienne
Term: FALL

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.

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 basic scenarios

TACKLED CONCEPTS

Portfolio mathematics; Portfolio return; Portfolio risk; Expected utility; Risk aversion; Efficient portfolios; Asset pricing models; Index models; Portfolio performance evaluation; Passive and active portfolio management.

LEARNING METHODS

24 hours face to face
Lectures
Case studies discussion
In class tutorials and practical exercises

EXPECTED WORK AND EVALUATION

Group Assignment: 50% of the final mark
Final Exam: 50% of the final mark

BIBLIOGRAPHY

Bodie, Z., Kane, A., Marcus, A-J. (2024). *Investments*. (13th ed.). McGraw-Hill. EBOOK

CFA Institute, (2023). *CFA program curriculum 2024 level I, 6. Portfolio management, ethical and professional standards*. Wiley. EBOOK

Additional required materials, including articles, handouts, slides, Excel files, etc., will be provided before or during the classes through the Blackboard page of the course.

Students are also encouraged to undertake their own search for additional relevant literature and follow up relevant references contained in the literature identified.

EVALUATION METHODS

50 % : Continuous assessment
50 % : Final exam

SESSIONS

1

Introduction
LECTURE : 02h00

I. Capital markets and the pricing of risk

1. Risk and Return: insights from 86 years of history
2. Common Measures of Risk and Return
3. Historical returns of stocks and bonds

2

I. Capital markets and the pricing of risk
LECTURE : 02h00

I.

4. The Historical Trade-Off Between Risk and Return
5. Common Versus Independent Risk
6. Diversification in Stock Portfolios

3

I. Capital markets and the pricing of risk
LECTURE : 02h00

4

II. Optimal portfolio choice and the CAPM
LECTURE : 02h00

1. The Expected Return of a Portfolio
2. The Volatility of a Two-Stock Portfolio
3. The Volatility of a Large Portfolio

5

II. Optimal portfolio choice and the CAPM
LECTURE : 02h00

4. Risk Versus Return: Choosing an Efficient Portfolio
5. Risk-Free Saving and Borrowing

6

II. Optimal portfolio choice and the CAPM
LECTURE : 02h00

6. The Efficient Portfolio and Required Returns
7. The Capital Asset Pricing Model
8. Determining the Risk Premium

7

III. Optimal portfolio choice and the CAPM
LECTURE : 02h00

1. The Equity cost of capital
2. The market portfolio
3. Beta Estimation

8

III. CAPM Optimal portfolio choice and the CAPM
LECTURE : 02h00

4. The debt cost of capital
5. A project's cost of capital

9

III. CAPM Optimal portfolio choice and the CAPM
LECTURE : 02h00

6. Project Risk Characteristics and Financing
7. Practical Considerations

10

III. CAPM Optimal portfolio choice and the CAPM
LECTURE : 02h00

6. Project Risk Characteristics and Financing
7. Practical Considerations

11

IV. Portfolio management - Investor Behavior and Capital Market Efficiency
BRIEFING : 02h00

1. Competition and Capital Markets
2. Information and Rational Expectations
3. The Behavior of Individual Investors

12

IV. Portfolio management - Investor Behavior and Capital Market Efficiency
LECTURE : 02h00

4. Systematic Trading Biases
5. The Efficiency of the Market Portfolio
6. Style-Based Techniques and the Market Efficiency Debate

13

IV. Portfolio management - Investor Behavior and Capital Market Efficiency
LECTURE : 02h00

7. Multifactor Models of Risk
8. Methods Used in Practice
9. Sustainability risk management

MSC_CFIB523
ADVANCED FINANCIAL ANALYSIS

Number of ECTS credits : 3
Course language : English
Course leader : MATON ERIC
Speakers : MATON ERIC
Term: FALL

COURSE DESCRIPTION

This course aims to develop a global perspective on financial analysis, from a strategic approach, an estimation of accounting quality, a recast of financial statements to valuation according to fundamental analysis.

COURSE OBJECTIVES

The aims are:

- be able to link corporate strategy to financial performance,

- be able to analyze quality of accounting information and to adjust accounting figures in function of different accounting methods,

- be able to recast financial statements and to use exhibits for new indicators: net operating assets, invested capital, capital employed, free cash flow, net debt and (recurring) operating profit,

- be able to make links between different classical ratios in financial analysis (ROCE, ROS, asset turnover, operating WC or WC requirement in % of sales, long-term operating assets in % of sales, CFROI, etc.),

- be able to forecast financial statements.

LEARNING OBJECTIVES

C4B learning goal	LG1 - Analysis
C4B learning objective	LO1 - Make use of critical analysis/critical thinking skills
Outcomes	Lev. 2 - Formulate a personal and well-informed opinion

C4B learning goal	LG1 - Analysis
C4B learning objective	LO3 - Use cross-disciplinary approaches
Outcomes	Lev. 2 - Select appropriate disciplinary fields to resolve a problem / situation

TACKLED CONCEPTS

The main concepts are:

- global framework of financial analysis,

- understanding of main differences between IFRS and US GAAP and reconciliation of financial statements under IFRS and US GAAP,

- forecasting financial statements in function of past financial statements (financial modeling) and other relevant information,

- DuPont analysis of return and action levers on return.

LEARNING METHODS

Case studies

Quiz

Chapters reading

Financial modeling under Excel

EXPECTED WORK AND EVALUATION

Readings from the textbook are necessary before sessions
Preparation of case studies before sessions are compulsory

BIBLIOGRAPHY

Textbook:

Koller, T., Goedhart, M., Wessels, D. (2020). *Valuation : measuring and managing the value of companies*. (7th ed.). Wiley. EBOOK
Chapters:
- Chapter 1 Why value value?
- Chapter 2 Finance in a nutshell?
- Chapter 3 Fundamental principles of value creation
- Chapter 8 Return on Invested Capital
- Chapter 9 Growth
- Chapter 10 Framework for valuation
- Chapter 11 Reorganizing the financial statements
- Chapter 12 Analyzing performance
- Chapter 13 Forecasting performance

EVALUATION METHODS

30 % : Continuous assessment
70 % : Final exam

SESSIONS

1

Financial statements under IFRS and US GAAP (part 1)

BRIEFING : 00h00

Session about the relations between financial statements through the basic business equation (or the balance sheet as an equation)

MCQ during the session

2

Financial statements under IFRS and US GAAP (part 2)

BRIEFING : 02h00

Main categories in P&L (or income statement)
Analysis of the P&L

3

Managerial balance sheet

BRIEFING : 02h00

Transformation of a balance sheet into a managerial balance sheet and comparable categories from one company to other companies

4

ROE decomposition

BRIEFING : 02h00

Comparison of two ROE decompositions

5

Standardized financial statements

BRIEFING : 02h00

New classification of amounts from financial statements into standardized categories allowing comparison between companies

6

Strategies and return analysis

BRIEFING : 02h00

Expected impacts of strategies on Return on Net Operating Assets (RNOA)

7 **Cash flow statement analysis**
BRIEFING : 02h00

Analysis of the 3 categories of cash
Reconciliation of net profit to operating cash flow

8 **Working capital requirement**
BRIEFING : 02h00

Working capital requirement (WCR) and WCR impact on return on net operating assets and operating cash flow

9 **Accounting adjustments (part 1)**
BRIEFING : 02h00

Accounting adjustments and impact on return on equity:
leases
R&D outlay

10 **Accounting adjustments (part 2)**
BRIEFING : 02h00

Accounting adjustments and impact on return on equity:
revenue,
noncash expense

11 **Creation of a financial model (part 1)**
BRIEFING : 02h00

Key ratios for a forecasting financial model

12 **Financial analysis applied to European recreational vehicules market**
BRIEFING : 02h00

Comparison of Thor, Trigano and Hunyvers performance

MSC_CFIB531
MONEY & BANKING

Number of ECTS credits : 3
Course language : English
Course leader : MEZERET THIERRY
Speakers : MEZERET THIERRY
Term: FALL

COURSE DESCRIPTION

COURSE DESCRIPTION
This course explores a wide range of topics involving money, financial institutions and financial markets, and the links between the financial sector and the central bank. It also examines the importance of banks and other financial institutions in the economy, and how information asymmetries and regulation have shaped their evolution. Throughout the course, issues How are interest rates determined, and how does the central bank conduct monetary policy? What economic factors drive the yield curves in different bond markets? We will pay particular attention to the banking system, with an eye toward understanding the function and importance of banks. Topics will include the role of the central bank as a lender of last resort during the recent, and prior, financial crises, unconventional monetary policy tools such as quantitative easing and forward guidance.

COURSE OBJECTIVES

This module aims to equip students with the tools to:

- Demonstrate knowledge and understanding of the nature and role of money and the interest rates
- Analyze the role of banks in the economy, evaluate their performance and justify their regulation
- Understand the role of banks and financial institutions in maintaining sustainability in the banking system
- Gain a better understanding of the banking sector, financial markets and their interaction with the broader economy
- Demonstrate knowledge and understanding of central banking and evaluate the conduct of monetary policy
- Advance your understanding of the role of the central bank and how monetary policy can influence growth and fluctuations in the economy
- Retrieve, analyze and interpret the economic and finance literature and provide policy recommendations

LEARNING OBJECTIVES

C4B learning goal	LG1 - Analysis
C4B learning objective	LO2 - Analyse complex situations
Outcomes	Lev. 2 - Formulate hypotheses to understand a complex situation, in a structured way, by mobilizing disciplinary frameworks if necessary

TACKLED CONCEPTS

See above

LEARNING METHODS

Lectures and home work

EXPECTED WORK AND EVALUATION

Evalaution

30% mid term quizz
70% final exam

BIBLIOGRAPHY

Mishkin, F-S. (2022). *The economics of money, banking, and financial markets*. (13th global ed.). Pearson. + EBOOK

EVALUATION METHODS

30 % : Continuous assessment
70 % : Final exam

MSC_CFIB532
BANK FINANCIAL MANAGEMENT

Number of ECTS credits : 3
Course language : English
Course leader : BAZIH Jad
Speakers : VINATIER Vincent
Term: FALL

COURSE DESCRIPTION

The unifying theme in this course is the application of modern finance theory to financial decision making in the management of banks and non-bank financial institutions. The subject of bank and financial institution decision-making is approached from a risk perspective. The course objectives are: (i) To provide students with an understanding of the modern model of financial institutions and the economic functions that they perform; (ii) Identify the main types of risk confronted by financial institutions; (iii) Apply relevant techniques to measure and manage those risks; (iv) To provide students with the ability to critically assess the effectiveness of the techniques used by banks to manage their risks(v) To provide students with an understanding of international bank management and financial services.

COURSE OBJECTIVES

At the completion of this course, you should be able to:

- identify and measure the key inherent risks faced by banks
- develop and apply strategies using tools and techniques to effectively manage these risks
- identify the strengths and weaknesses that exist in the approaches currently available to measure the financial risks faced by financial institutions
- understand the mechanics behind the responsible management of financial institutions
- assess the appropriateness of the various approaches in formulating risk management strategies
- present findings in the form of a report, including recommendations for action which are supported by quantitative and qualitative analysis
- participate as a member of a team to undertake analysis of a business situation and to present the team's findings and recommendations
- describe the failings of financial institutions during the 2008 GFC and the identify the extent to which these failings can be traced back to poor ethical and governance frameworks
- analyze everyday financial/banking news and reflect on the new developments in the banking industry

TACKLED CONCEPTS

modern finance theory; financial decision making; management of financial institutions; bank portfolio risk; bank risk management; sustainability in banking; bank regulation.

LEARNING METHODS

24 hours face to face
Lectures
Case studies discussion
In class tutorials and practical exercises

EXPECTED WORK AND EVALUATION

Class Assignment: 30% of the final mark
Final Exam : 70% of the final mark

BIBLIOGRAPHY

Saunders, A. Cornett, M., and Erhemjamts, O., 2022. Financial markets and institutions, 8th Edition, McGrawHill

Mishkin, F-S., Eakins, S-G. (2018). *Financial markets and institutions*. (9th global ed.). Pearson. + EBOOK

EVALUATION METHODS

30 % : Continuous assessment
70 % : Final exam

SESSIONS

1 **Introduction**
LECTURE : 02h00

2 **Commercial Banks**
LECTURE : 02h00

3 **Bank financial statements**
LECTURE : 02h00

4 **Types of risks**
LECTURE : 02h00

5 **Credit risk: individual loan risk measurement - loan portfolios and concentration risk measurement**
LECTURE : 02h00

6 **Liquidity risk: measurement and management**
LECTURE : 02h00

7 **Interest rate risk**
LECTURE : 02h00

8 **Managing Risk off the Balance Sheet with Derivative Securities**
LECTURE : 02h00

9 **Loan sales and securitization**
LECTURE : 02h00

10 **Bank regulation: Micro/Macro prudential Policy**
LECTURE : 02h00

11 **The future of banking; Responsible banking**
LECTURE : 02h00

12 **Review/Quiz**
PRACTICAL WORK : 02h00

MSC_CFIB533
INTERNATIONAL BANKING MANAGEMENT

Number of ECTS credits : 3
Course language : English
Course leader : BAZIH Jad
Speakers : SHABANI Mimoza
Term: FALL

COURSE DESCRIPTION

This course covers various theoretical and applied issues for the international financial markets in which international banks operate in. Topics covered include theories of international banking; internationalization of banking - US, Japan and Chinese experience; competitiveness strategies; international banking and debt crises; Euro currency markets; financial secrecy and money laundering; and the role of foreign banks in emerging markets; corporate social responsibility.

COURSE OBJECTIVES

At the completion of this course, students should be able to:

- explain the trends of and factors behind the current and past international financial market developments relevant for international commercial and investment banks
- identify and explain the (policy) implications of current financial market developments in relation to international banks' strategic positioning
- understand the mechanics behind the responsible management of financial institutions
- apply the experience of an independent research performed as a requirement of a group project to conduct further research to answer research question posed in a topic related to international banking industry

TACKLED CONCEPTS

International banking; determinants and speculation during crises; responsible banking; financial secrecy and money laundering; sovereign risk; competitive strategies; loan syndication.

LEARNING METHODS

- Lectures
- Case studies
- Exercises
- Practical exercised

EXPECTED WORK AND EVALUATION

Group Assignment-Continuous assessment: 30% of the final mark
Final Exam: 70% of the final mark

BIBLIOGRAPHY

International Bank Management. Dileep Mehta, Hung-Gay Fung. Wiley.

Financial Institutions Management. Anthony Saunders, Marcia Million Cornett, McGraw Hill.

International Banking in Global Perspective. Carmela D'Avino, Mimoza Shabani, Routledge

Introduction to Banking. Barbara Casu, Claudia Girardone, Philip Molyneux, Pearson

International Finance. Ephraim Clark, Cengage Learning

EVALUATION METHODS

30 % : Continuous assessment
70 % : Final exam

SESSIONS

1 **Introduction**
LECTURE : 02h00

2 **Overview of international banking**
LECTURE : 02h00

3 **Internationalisation of banking - US, Japan and Chinese experience**
LECTURE : 02h00

4 **Responsible banking; Secret money and international banks**
LECTURE : 02h00

5 **Competitive strategies in international banking**
LECTURE : 02h00

6 **Risk and Liquidity management**
LECTURE : 02h00

7 **Role of foreign banks in emerging markets**
LECTURE : 02h00

8 **International loan syndication**
LECTURE : 02h00

9 **International banking crises**
BRIEFING : 02h00

10 **Sovereign lending and country risk**
LECTURE : 02h00

11 **Corporate Social Responsibility (Climate Risk)**
BRIEFING : 02h00

12 **Review**
PRACTICAL WORK : 02h00

MSC_CFIB562_SS
COLLABORATE & MANAGE ACROSS CULTURES - *ELECTIVE COURSE*

Number of ECTS credits : 3
Course language : English
Course leader : BURLAT CLAIRE
Speakers : MALAVE Andrés
Term: FALL

COURSE DESCRIPTION

Cultures surround and permeate organizations of all types and forms. International managers therefore need to navigate across national, organizational, industrial, and occupational cultures. This course provides some compasses to facilitate such navigation. It examines in conceptual and practical terms:

- How to define, disentangle, and address different cultural ensembles within and around organizations;

- How the concept of cultural dimensions and the notion of national organizational cultures support strategic management;

- How contemporary managers and consultants respond to the challenge of increasing cultural diversity;

- How managers experience internationalization and may envision the construction of a global organization; and

- How the current global cultural dynamics affects human development and environmental conservation.

COURSE OBJECTIVES

By following this course, students should:

- Develop a conceptual understanding and start to master the practical application of the domains listed in the course description.

- Become more aware of their own cultural biases and gain a more attentive understanding of the cultural predispositions behind the behaviour of others.

TACKLED CONCEPTS

Culture as competitive advantage and as resistance to competitive advancement; stereotyping; cultural relativism; concurrent conceptualizations of culture; levels of cultures; cultural dimensions; cultural dispositions; the notion of national organizational cultures; acculturation processes; expatriation/ repatriation; multicultural teams; cosmopolitanism; ethical implications of cultural management; emic and etic approaches to cultural studies; cultural shock; intercultural integration; nonverbal communication; languages and culture; stereotypes, self-awareness, and ethnocentrism.

LEARNING METHODS

Lectures, seminars, group assignments, role-playing, case studies, individual and group self-reflections

EXPECTED WORK AND EVALUATION

Group presentations, individual short essays, participation in class, and discussions.

The final mark will combine grades of continuous assessment (50%) and final assignment (50%).

BIBLIOGRAPHY

Azevedo, G. (2011). "Intercultural Integration in Sino-Brazilian Joint Ventures," in: Primecz, H., L. Romani, & S. Sackmann (Eds.), Cross-cultural management in practice: Culture and negotiated meanings. Cheltenham: Edward Elgar.

Azevedo, G. (2020). "Does Organizational Nonsense Make Sense? Laughing and Learning From French Corporate Cultures". Journal of Management Inquiry, 29(4), 385-403.

Barmeyer, C-I., Franklin, P. (2016). *Intercultural management : a case-based approach to achieving complementarity and synergy*. Palgrave Macmillan.

Barmeyer, C-I., Bausch, M., Mayrhofer, U. (2021). *Constructive intercultural management : integrating cultural differences successfully*. Edward Elgar Publishing.

Iribarne, P-d. (1989). *La logique de l'honneur : gestion des entreprises et traditions nationales*. Seuil. EBOOK

Esbjörn-Hargens,S. (2012) An overview of Integral Theory: An all-inclusive framework for the twenty-first century: https://psycnet.apa.org/record/2010-18793-001

Gannon, M. J., & Pillai, R. (2012) Understanding Global Cultures: Metaphorical Journeys through 31 Nations, Clusters of Nations, Continents, and Diversity (5th ed.): SAGE.

Harari, Y-N. (2015). *Sapiens : a brief history of humankind*. Vintage Books.

Hochachka,G. (2015) Integral Transformation of Value Chains: One Sky's Integral Leadership Program in the Brazil Nut Value Chain in Peru and Bolivia: www.integralwithoutborders.org

Hofstede, G., Hofstede, G-J., Minkov, M. (2010). *Cultures and organizations : software of the mind : intercultural cooperation and its importance for survival.* (3e éd.). McGraw-Hill.

Laloux, F. (2024). *Reinventing organizations : vers des communautés de travail inspirées.* Diateino.

Nisbett, R-E. (2003). *The geography of thought : how Asians and Westerners think differently...and why*. Free Press. EBOOK

Primecz, H., Romani, L., Sackmann, S. (2011). *Cross-cultural management in practice : Cultures and negotiated meanings*. Edward Elgar Publishing.

Reich, R. (2016). *Saving capitalism : for the many, not the few* . Icon Books. EBOOK

Barsoux, J-L., Schneider, S-C., Stahl, G-K. (2014). *Managing across cultures.* (3rd ed.). Pearson. EBOOK

Steers, R. M., Sanchez-Runde, C. J., & Nardon, L. (2010). Management Across Cultures: Challenges and Strategies: Cambridge University Press.

Trompenaars, F., Hampden-Turner, C. (2012). *Riding the waves of culture : understanding diversity in global business*. (3e éd.). McGraw-Hill.

EVALUATION METHODS

100 % : Continuous assessment

MSC_CFIB541
FINANCIAL MATHEMATICS

Number of ECTS credits : 3
Course language : English
Course leader : BAZIH Jad
Speakers : MOUSA Saeed
Term: SPRING

COURSE DESCRIPTION

This course provides an in-depth introduction to essential topics in financial mathematics. It covers theoretical foundations and practical applications in areas such as portfolio optimization, time value of money, probability, regression, and time series analysis. Designed for students with an interest in finance and analytics, the course equips participants with the mathematical tools needed to solve real-world financial problems.

COURSE OBJECTIVES

Develop a strong understanding of core mathematical concepts used in finance.
Apply techniques like regression and time series analysis to financial data.
Calculate and interpret the time value of money and annuities.
Optimize investment portfolios using mathematical approaches.

TACKLED CONCEPTS

Portfolio Optimization
Probability
Regression Analysis
Time Series Analysis
Time Value of Money (Basic)
Time Value of Money (Annuities)

LEARNING METHODS

Lectures covering theoretical concepts
Practical exercises and real-world case studies
Problem-solving sessions and group discussions

EXPECTED WORK AND EVALUATION

Regular class participation
Problem sets based on real-world data
Case study reports

BIBLIOGRAPHY

Bodie, Z., Kane, A., Marcus, A-J. (2024). *Investments*. (13th ed.). McGraw-Hill. EBOOK
Hull, J. (2022). *Options, futures, and other derivatives*. (11th global ed.). Pearson. EBOOK

Lecture notes and additional articles provided during the course

EVALUATION METHODS

30 % : Continuous assessment
70 % : Final exam

SESSIONS

1 **Introduction**

LECTURE : 02h00

this session is a general introduction to the course, where the different course subjects will be proposed. There will also be instructions about how to install and use the needed software.

2 **Probability**

LECTURE & PRACTICAL WORK : 02h00

A foundational session on probability theory with a focus on its applications in finance. Topics include basic probability concepts, probability distributions, and their use in modeling financial uncertainty and risk.
This session delves deeper into probability concepts such as conditional probability, independence, and Bayes' theorem. Practical examples will illustrate how these concepts apply to financial problem-solving and decision-making.

3 **Regression Analysis (Part 1)**

LECTURE & PRACTICAL WORK : 02h00

Introduction to linear regression and its importance in finance. Topics include simple regression analysis, interpretation of regression coefficients, and assessing model fit. Real-world financial datasets will be used for practical exercises.

4 **Regression Analysis (Part 2)**

LECTURE & PRACTICAL WORK : 02h00

Focus on multiple regression analysis, exploring how to model relationships between several independent variables and a dependent variable. This session emphasizes diagnosing issues like multicollinearity and practical applications in financial trend analysis.

5 **Time Series Analysis (Part 1)**

LECTURE & PRACTICAL WORK : 02h00

Introduction to time series data and its unique characteristics, such as trends, seasonality, and autocorrelation. This session explains the importance of stationarity and covers basic time series models like moving averages.

6 **Time Series Analysis (Part 2)**

LECTURE & PRACTICAL WORK : 02h00

Focuses on forecasting techniques using time series models like ARIMA and exponential smoothing. Practical examples will show how these methods are used to predict financial variables such as stock prices and market trends.

7 **Time Value of Money - Annuities (Part 1)**

LECTURE & PRACTICAL WORK : 02h00

Explores annuities, focusing on ordinary annuities and annuities due. Students will learn how to calculate and interpret these financial tools and their relevance in areas such as loan amortization and retirement planning.

8 **Time Value of Money - Annuities (Part 2)**

LECTURE & PRACTICAL WORK : 02h00

Discusses perpetuities and their applications in financial models. This session also examines practical scenarios, such as evaluating fixed-income securities and real estate investments, using annuity and perpetuity formulas.

9 **Portfolio Optimization (Part 1)**

LECTURE & PRACTICAL WORK : 02h00

Introduction to the basics of portfolio optimization, focusing on the Markowitz model. The session will cover concepts like expected returns, risk measurement, and the risk-return tradeoff, emphasizing the role of diversification in portfolio management.

10

Portfolio Optimization (Part 2)

LECTURE & PRACTICAL WORK : 02h00

Building on the first session, this lecture explores advanced topics in portfolio optimization, such as adding constraints, optimizing under different scenarios, and practical applications. Students will learn how to construct efficient portfolios in real-world contexts.

11

Asset valuation (Part 1)

LECTURE & PRACTICAL WORK : 02h00

This session introduces the fundamental principles of asset valuation, focusing on the core concepts and methodologies used in financial mathematics. Topics include the time value of money, present and future value calculations, and the valuation of fixed-income securities such as bonds. Students will explore the relationship between cash flows, discount rates, and risk assessment in determining asset values. Practical examples and case studies will help bridge theory with real-world applications.

12

Asset valuation (Part 2)

LECTURE & PRACTICAL WORK : 02h00

Building on the foundational concepts from Part 1, this session delves deeper into advanced asset valuation techniques. Topics include equity valuation models, such as dividend discount models (DDM) and price-to-earnings ratios, as well as the valuation of derivative instruments like options and futures. Students will also learn how market dynamics, economic conditions, and financial modeling influence asset prices. This session emphasizes analytical skills and practical problem-solving in complex valuation scenarios.

MSC_CFIB542
RISK MANAGEMENT

Number of ECTS credits : 3
Course language : English
Course leader : BAZIH Jad
Speakers : LANDRON Etienne
Term: SPRING

COURSE DESCRIPTION

Risk is an integral part of financial decisions. Following the rapid evolution of the discipline of financial risk management, analysts must be prepared to access the level of risk in the marketplace. This course explores the basic concepts of modelling, measuring and managing financial risks within the regulatory framework. Topics covered include market risk (value-at-risk and expected loss), credit risk (single name, portfolio, ratings and market-based models, credit derivatives), liquidity risk and operational risk. To overcome the rather quantitative nature of the topics, the course relies heavily on practical based lab exercises with emphasis on simulations, real life examples and case studies.

COURSE OBJECTIVES

At the completion of this course, students should be able to:

- identify and explain the characteristics of market, credit, operational, legal, regulatory and reputation risk
- identify key financial risks in corporations
- construct and evaluate risk management models
- apply hedging techniques in managing market risk

TACKLED CONCEPTS

Value at risk (VaR)
Credit VAR
Forecasting
Volatility
Correlations
Stress testing
Ratings
Default probabilities and credit default swap (CDS)
Credit risk modelling
Structured products and securitization
Collateralized debt obligations (CDOs)

LEARNING METHODS

- Constant engagement of students during and outside of class.
- Prior reading of the course material before each session.
- Preparation of case studies.

EXPECTED WORK AND EVALUATION

Course (theoretical part) and case studies/problems/exercises (practical part)
Group Assignment: 30% of the final mark
Final Exam : 70% of the final mark

BIBLIOGRAPHY

Value at Risk (3rd Edition) by Philippe Jorion (2007)
Jorion, P., Global Association Of Risk Professionals, (2009). *Financial risk manager handbook.* (5e éd.). Wiley.
Hull, J. (2023). *Risk Management and Financial Institutions, 6th Edition*. Wiley.
Hull, J. (2022). *Options, futures, and other derivatives*. (11th global ed.). Pearson. EBOOK
Madura, J., Fox, R. (2023). *International financial management*. (6th ed.). Cengage.

EVALUATION METHODS

30 % : Continuous assessment
70 % : Final exam

SESSIONS

1 **Introduction**
LECTURE : 02h00

2 **Types of risk and objectives of risk management**
LECTURE : 02h00

3 **Value at risk (VaR) and Expected shortfall (CVaR)**
LECTURE : 02h00

4 **VaR precision and time aggregation, Backtesting of VaR and Liquidity (unwinding positions)**
LECTURE : 02h00

5 **Portfolio VaR, Analytical approach to VaR, Multivariate models, Mapping, correlations and copulas**
LECTURE : 02h00

6 **Forecasting, Volatility and Correlations**
LECTURE : 02h00

7 **VaR methods: Delta normal, historical simulation and Monte Carlo simulation**
LECTURE : 02h00

8 **Stress testing, Scenarios and Integrated risk management**
LECTURE : 02h00

9 **Credit risk 1: Ratings, Default probabilities and credit default swap (CDS)**
LECTURE : 02h00

10 **Credit risk 2: Credit risk modelling, Credit VaR**
LECTURE : 02h00

11 **Financial crisis, Structured products and securitization, Collateralised debt obligations (CDOs)**
LECTURE : 02h00

12 **Review**
LECTURE : 02h00

MSC_CFIB543
FINANCIAL ENGINEERING

Number of ECTS credits : 3
Course language : English
Course leader : ROMERO MORENO José Carlos
Speakers : ROMERO MORENO José Carlos

COURSE DESCRIPTION

This course introduces students to the principles and methods of financial engineering, combining **time series analysis**, **portfolio optimization**, and **algorithmic trading**, with a strong emphasis on practical applications in Python. The course bridges **quantitative finance** with **modern machine learning techniques**, equipping students with essential tools for analyzing financial data, building predictive models, and developing trading strategies. Students will gain both theoretical understanding and hands-on experience, applying advanced methods such as **time series forecasting**, **Monte Carlo simulation**, **optimization algorithms**, and **reinforcement learning** to real-world financial problems. The course culminates with a **group project**, allowing students to apply learned concepts to a practical case study using real datasets.

COURSE OBJECTIVES

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

- Acquire **practical programming skills in Python** for data analysis and modeling in finance.
- Understand and apply **time series analysis methods** for forecasting and anomaly detection in financial datasets.
- Formulate and solve **portfolio optimization problems**, including **risk-return trade-offs**, **efficient frontier construction**, and **option pricing**.
- Design and implement **algorithmic trading strategies**, including **trend-following** and **machine learning-based strategies**.
- Explore and apply **reinforcement learning techniques** to algorithmic trading.
- Understand and apply **statistical factor models** for identifying underlying drivers of asset returns.
- Develop critical thinking by applying learned methods in a **group project** involving real financial data.

LEARNING OBJECTIVES

C4B learning goal	LG1 - Analysis
C4B learning objective	LO1 - Make use of critical analysis/critical thinking skills
Outcomes	Lev. 3 - Detect one's own biases and evaluate their impacts on the formulated opinion

C4B learning goal	LG1 - Analysis
C4B learning objective	LO2 - Analyse complex situations
Outcomes	Lev. 2 - Formulate hypotheses to understand a complex situation, in a structured way, by mobilizing disciplinary frameworks if necessary

TACKLED CONCEPTS

- **Time series analysis**: forecasting models (Holt-Winters, ARIMA/SARIMA), anomaly detection with Matrix Profile, and panel data regression.
- **Portfolio optimization**: Monte Carlo simulations, mean-variance optimization, Sharpe ratio, and efficient frontier construction.
- **Option pricing models**: Black-Scholes-Merton model and applications using Python libraries (e.g., PyFENG)
- **Convex optimization**: linear and quadratic programming applied to portfolio construction and risk management.
- **Algorithmic trading strategies**: trend-following (moving averages), regression-based models, and machine learning-driven strategies.
- **Reinforcement learning in finance:** Markov Decision Processes, Q-learning, and Bellman equation solutions for trading strategy design.
- **Practical implementations in Python**: from theory to code and model evaluation

LEARNING METHODS

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

1. Apply **Python programming** to financial data analysis and modeling.
2. Conduct **time series forecasting and anomaly detection** using advanced models.
3. Formulate and solve **portfolio optimization** problems using Monte Carlo simulation and convex optimization techniques.
4. Design and evaluate **algorithmic trading strategies**, including machine learning and reinforcement learning models.
5. Collaborate in teams to solve real-world financial problems through a **practical case study project**.

EXPECTED WORK AND EVALUATION

The course evaluation consists of an individual final exam (70%) and a group project (30%). The final exam, completed by hand on paper, tests each student's grasp of theoretical concepts and mathematical problem-solving in financial engineering. The group project involves developing a financial project in Python and presenting it to the class, allowing students to demonstrate their ability to apply course concepts to practical scenarios and effectively communicate their findings. Active participation and completion of practice assignments, though ungraded, are encouraged to reinforce learning and prepare for both the exam and project.

BIBLIOGRAPHY

McKinney, W. (2022). *Python for data analysis : data wwrangling with panda, NumPy & Jupyter*. (3rd ed.). O'Reilly Media. + EBOOK
De Prado, M. L. (2018). *Advances in Financial Machine Learning*. Wiley.
Boucher, C. M., & Chevallier, J. (2021). *Machine Learning for Asset Managers*. Cambridge University Press.

EVALUATION METHODS

30 % : Continuous assessment
70 % : Final exam

SESSIONS

1

Introduction to Python

LECTURE : 02h00

Review essential Python concepts related to financial engineering: basic data manipulation, functions, data visualization.

2

Time Series Analysis with Python

LECTURE : 04h00

Explore the fundamentals of time series analysis with python:

Time Series Analysis I:

- Holt-Winters Exponential Smoothing.
- ARIMA and SARIMA models.

Time Series Analysis II:

- The Matrix Profile for anomaly detection and forecasting (advanced algorithm for time series).

• **Time Series Analysis III**:

- Panel Data Regression (combining time series with cross-sectional data).

3

Portfolio Optimization & Option Pricing

LECTURE : 06h00

Portfolio Optimization I:

- Two-Stock Portfolio simulation using Monte Carlo methods.
- Mean-Variance Optimal Portfolios, Sharpe Ratio, Risk-free asset, and Tangency Portfolio.

Portfolio Optimization II:

- Standard Option Pricing Models:
- Black-Scholes-Merton Model.
- Applications using PyFENG (Python Financial Engineering library).

Introduction to Convex Optimization:

- Linear and Quadratic Programming applied to portfolio optimization.
- Efficient Frontier & Capital Market Line concepts.

4

Algorithmic Trading I

LECTURE : 02h00

Trend-Following Strategies using Simple Moving Averages (SMA).

Machine Learning-Based Trading Strategies: regression-based forecasting and strategy design.

5

Algorithmic Trading II

LECTURE : 02h00

Introduction to **Reinforcement Learning in Finance**:

• Markov Decision Processes.

• Q-Learning for trading strategies.

• Solving Bellman Equation via Reinforcement Learning.

6

Statistical Factor Models & LBO Model

LECTURE : 02h00

Statistical Factor Models: understanding latent factors driving asset returns using**unsupervised learning** techniques.

LBO model for financial modelling

7

Group Project

PRACTICAL WORK : 06h00

- Proposal of Case Study
- Selection of original Dataset per group
- Apply methods seen in class to analyze datastet
- Prepare presentation about insights obtained by application of the methods

MSC_CFIB551
CASH MANAGEMENT AND DERIVATIVES

Number of ECTS credits : 3
Course language : English
Course leader : MIFFRE JOELLE
Speakers : MIFFRE JOELLE
Term: SPRING

COURSE DESCRIPTION

This module aims to provide students with the necessary training to develop an advanced understanding of derivatives, money markets and foreign exchange.
Part 1. Gives the students an in-depth knowledge of derivatives (options, forwards, futures and swaps), so that they are able to calculate the price of such instruments from first principles and use them for risk and asset management.
Part 2. Is dedicated to give students a strong knowledge and understanding of money market instruments and cash management.
Part 3. Provides students with specialist knowledge of currency markets, their pricing and their risk.
Cross-over program with the following modules:
- Portfolio management

COURSE OBJECTIVES

Upon completion of the module, you should have:

- an in-depth knowledge of the functionality and pricing of basic derivative products,
- a deep understanding of the use of derivatives for risk management and asset management,
- specialist knowledge of the different types of cash instruments in the money markets,
- advanced and critical understanding of how firms can hedge their FX exposure or speculate in the forex market.

TACKLED CONCEPTS

Options: Concept, strategies, pricing and the Greeks
Forwards and futures: Concepts and strategies
Commodity futures: Strategies, Sustainability
Interest rate swaps and currencies swaps: Concept, strategies, pricing
Money market instruments and cash management
Exchange rates: Quotations, strategies, pricing

LEARNING METHODS

Week 1: **Options markets and strategies:**
Definition of calls and puts, Payoffs and P&L, Underlying assets, Strategies involving one or more options and a stock

Week 2: **Options markets and strategies:**
Strategies involving one or more options of the same class, Strategies involving options from different classes

Week 3: **Option pricing:**
Determinants of option prices, Arbitrage pricing (put-call parity), Binomial model

Week 4: **Hedging and the Greeks:**
Introduction to the Greeks (delta, gamma, vega, theta, rho): definition, calculation, and use for risk management, relationship between the Greeks, the reality of hedging

Week 5: **Forwards and futures:**
Definition of forward and futures contracts, margin requirements, comparison between forwards and futures
Strategies: Hedging and speculation

Week 6: **Commodity futures:**
Long-only investment: Performance, inflation hedging, diversification
Long-short investment: Normal backwardation, Hedging pressure, Term structure
Sustainable commodity investing

Week 7: **Interest rate swaps:**
Definition and quotation; Uses: Transformation of a liability, transformation of an asset; Pricing

Week 8: **Currency swaps:**
Definition, Uses, Pricing

Week 9: **Money market instruments and cash management:**
Money market instruments and Cash management models (Baumol and Miller-Orr)

Week 10: **Currencies:**
Foreign exchange quotations, Strategies in FX markets (hedging)

Week 11: **Currencies:**
Strategies in FX markets (speculation, arbitrage), Exchange rate determination

Week 12: **Revisions**
The students are invited to do the recommended exercises as the course unfolds. The answers are provided, so students shall be able to run through the exercises on their own. Time permitting, we will cover together in the last class the exercises that students find most challenging.

EXPECTED WORK AND EVALUATION

Group Assignment: 30% of the final mark,
Final Exam: 70% of the final mark.

BIBLIOGRAPHY

Hull, J. (2022). *Options, futures, and other derivatives*. (11th global ed.). Pearson. EBOOK
Madura, J., Fox, R. (2023). *International financial management*. (6th ed.). Cengage.

EVALUATION METHODS

30 % : Continuous assessment
70 % : Final exam

MSC_CFIB552
BLOCKCHAIN & CRYPTOFINANCE

Number of ECTS credits : 3
Course language : English
Course leader : SALZMAN Diego
Speakers : SALZMAN Diego
Term: SPRING

COURSE DESCRIPTION

This course offers an in-depth exploration of blockchain technology and its transformative potential across multiple industries. The course examines the origins of blockchain, its evolution, and the development of cryptocurrencies like Bitcoin and Ethereum. Students will gain insights into the technical and economic underpinnings of blockchain, smart contracts, and decentralized applications (DApps). The course also explores blockchain's impact on traditional financial systems, regulatory frameworks, and emerging fields such as DeFi and NFTs.

COURSE OBJECTIVES

- Understand the development and significance of blockchain technology and cryptocurrencies.
- Compare different consensus mechanisms and evaluate their strengths and limitations.
- Analyze the role of smart contracts and their applications in automating business processes.
- Evaluate the opportunities and challenges posed by decentralized finance (DeFi) and decentralized autonomous organizations (DAOs).
- Examine the regulatory landscape and its implications for blockchain innovation and adoption.
- Assess the potential of blockchain technology to disrupt traditional industries and create new business models.

TACKLED CONCEPTS

Introduction to Digital Currencies and Blockchain Technology
- History of digital currencies and blockchain
- Bitcoin's emergence and its foundational role in the blockchain ecosystem
- Evolution of blockchains and their broader applications

Ethereum and Blockchain 2.0
- Technical architecture and capabilities of Ethereum
- Smart contracts: theory, development, and applications
- Decentralized applications (DApps) and their use cases

Consensus Mechanisms and Blockchain Security
- Overview of consensus mechanisms: Proof-of-Work, Proof-of-Stake, Delegated Proof-of-Stake, and more
- Scalability challenges and potential solutions (e.g., sharding, layer 2 solutions)
- Security risks and vulnerabilities in blockchain networks

Private Blockchains and Enterprise Solutions
- Distinction between public and private blockchains
- Use cases of private blockchains in supply chain, finance, and government sectors

Decentralized Finance (DeFi) and Blockchain 3.0
- Overview of DeFi: protocols, platforms, and products
- Economic incentives and risk management in DeFi
- Case studies on lending, borrowing, and yield farming in DeFi

Decentralized Autonomous Organizations (DAOs) and Governance
- Structure and functioning of DAOs
- Governance models and tokenomics
- Impact of DAOs on traditional organizational structures

Regulatory Challenges and Compliance in Blockchain
- Global regulatory landscape for blockchain and cryptocurrencies
- Compliance strategies for blockchain-based projects
- Regulatory concerns for Initial Coin Offerings (ICOs), Security Token Offerings (STOs), and NFTs

NFTs and the Future of Digital Finance
- Introduction to Non-Fungible Tokens (NFTs): standards and use cases
- NFT marketplaces and valuation
- Future trends and potential disruptions in digital assets

LEARNING METHODS

This course will employ a blend of lectures, case studies, group discussions, and practical exercises. Real-world examples, current developments, and hands-on projects will illustrate key concepts. Students will actively engage in debates on emerging issues, analyze case studies, and apply blockchain principles to build sample decentralized applications.

EXPECTED WORK AND EVALUATION

1. Continuous Assessment (30%)Class Participation :
    - Active engagement in class discussions and exercises will be assessed.
    - Assignments and Quizzes: Students will have to complete assignments and Quizzes related to the topics covered during the sessions

2. Final Exam (70%): A comprehensive final examination will assess the overall understanding of the course material.

BIBLIOGRAPHY

Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System .
Antonopoulos, A. M. (2017). Mastering Bitcoin: Unlocking Digital Cryptocurrencies. O'Reilly Media.
Buterin, V. (2015). Ethereum White Paper: A Next-Generation Smart Contract and Decentralized Application Platform .
Tapscott, D., & Tapscott, A. (2016). Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World . Penguin.
Narayanan, A., Bonneau, J., Felten, E., Miller, A., & Goldfeder, S. (2016). Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction . Princeton University Press.
Werbach, K. (2018). The Blockchain and the New Architecture of Trust. MIT Press.

EVALUATION METHODS

30 % : Continuous assessment
70 % : Final exam

SESSIONS

1 **The Genesis of Innovation: Unveiling the Origins of Blockchain and Digital Currencies**
BRIEFING : 02h00

Exploring the history of Bitcoin, blockchain's rise, and its transformative journey

2 **Beyond Bitcoin: The Emergence of Blockchain 2.0 and Ethereum’s Revolution**
BRIEFING : 02h00

Understanding Ethereum's architecture, smart contracts, and the dawn of decentralized applications.

3 **Unlocking Consensus: The Art and Science of Blockchain Validation**
BRIEFING : 02h00

A deep dive into consensus mechanisms, scalability challenges, and innovative solutions.

4 **Chains of Trust: Private Blockchains and the Enterprise Advantage**
BRIEFING : 02h00

Analysing the role of private blockchains in reshaping industries from finance to governance.

5 **DeFi Unleashed: Redefining Financial Systems Through Decentralisation**
BRIEFING : 02h00

Navigating the DeFi ecosystem with case studies on protocols, platforms, and risk management.

6 **Autonomous Evolution: DAOs and the Future of Organisational Governance**
BRIEFING : 02h00

Investigating DAOs, governance structures, and their impact on traditional organisations.

7 **Navigating the Regulatory Labyrinth: Blockchain Compliance and Challenges**
BRIEFING : 02h00

Decoding global regulations, compliance strategies, and legal frameworks in blockchain projects.

8 **Tokens of Uniqueness: NFTs and the Reinvention of Digital Ownership**
BRIEFING : 02h00

Exploring NFT standards, marketplace dynamics, and their role in digital finance.

9 **The Security Paradigm: Safeguarding Blockchain Networks**
BRIEFING : 02h00

Examining blockchain vulnerabilities and cutting-edge solutions for a secure ecosystem.

10 **Blockchain 3.0: The Next Leap in Decentralised Innovations**
BRIEFING : 02h00

Exploring the frontiers of blockchain evolution with futuristic applications and trends.

11 **Crypto-Economics: Tokenomics and Incentive Design in Decentralised Systems**
BRIEFING : 02h00

Delving into the economics of cryptocurrencies, governance tokens, and decentralised incentives.

12 **Blockchain Horizons: Future Disruptions and Global Impacts**
BRIEFING : 02h00

A visionary discussion on the transformative potential of blockchain technology across industries

MSC_CFIB563_GAIA
GREEN ENERGY FINANCE

Number of ECTS credits : 3
Course language : English
Course leader : BURLAT CLAIRE , LEROY-BOURGUIN Thomas
Speakers : LEROY-BOURGUIN Thomas , WOLF Julia
Term: SPRING

COURSE DESCRIPTION

The Paris Agreement aims at “making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development” (Article 2 c of the Paris Agreement). This ambition require a significant increase in funding – with new instruments and approaches required to mobilize a broad range of investors and to achieve scalability in financing climate action.
Through this course, students will explore the fundamentals of renewable energy (RE) and energy efficiency (EE) financing dimensions.

COURSE OBJECTIVES

In the first part, students will need to grasp the general principles of how the energy market operates in France and worldwide. Emphasis will be placed on decarbonization scenarios of the energy mix, notably through the increased use of renewable electricity sources.
This introduction will help students understand the role that renewable energies should play in the energy mix, including primarily Wind Energy and Solar Energy. On a supplementary basis, students will review interest of hydro power, Methanization, Geothermal Energy, Hydrogen. Students will then be able to comprehend the challenges associated with each of these renewable energies (intermittency, complementarity, environmental and social impacts).
Once these issues are defined, students will learn to construct a financial model for developing such projects. The impact of the financial model on project management will be particularly addressed.
In the last part, students will be able to imagine various methods to direct global available savings towards renewable energy projects, including traditional financial markets, as well as financial innovations and also the fiscal Instruments.

LEARNING OBJECTIVES

C4B learning goal	LG1 - Analysis
C4B learning objective	LO2 - Analyse complex situations
Outcomes	Lev. 3 - Support one's conclusions and issue well-reasoned recommendations

C4B learning goal	LG4 - CSR
C4B learning objective	LO12 - Take a decision from economic, social and environmental perspectives
Outcomes	Lev. 3 - Make choices and arbitrate according to sustainability criteria

TACKLED CONCEPTS

Energy mix
Electricity decarbonization paths
Renewable energy impact
Renewable energy business plan
Renewable energy project development

LEARNING METHODS

The speakers will present the current state of knowledge on renewable energies (mainly solar and wind) to prompt students to question:
The proper way to modify the energy mix in the coming years,
The proper way to develop renewable energy projects.
Following these initial reflections, a practical case study will help determine the impact of the standards expected by the financing market on the real-life aspects of projects. Significant time will be devoted to exchange and debate to demonstrate that there is not a single correct path to increase the share of renewable energy in the global energy mix.

EXPECTED WORK AND EVALUATION

Part 1 : Group work.
Each group will be assigned a renewable energy project that they must defend before a fictitious investment committee. A clear and motivating presentation should be prepared in addition to a robust business plan constructed according to industry standards.
Part 2 : Individual exam.
To be defined.

BIBLIOGRAPHY

RTE Transition 2050 https://www.rte-france.com/analyses-tendances-et-prospectives/bilan-previsionnel-2050-futurs-energetiques
ADEME https://www.ademe.fr/
SER (Syndicat des énergies renouvelables) https://www.syndicat-energies-renouvelables.fr/
France 2030 Investment Plan https://www.economie.gouv.fr/france-2030

EVALUATION METHODS

100 % : Continuous assessment

SESSIONS

1 **Energy Mix in Europe and in France**
LECTURE : 03h00

2 **Decarbonizing energy mix through renewable energy**
LECTURE : 03h00

3 **Focus on Solar/Wind Energy concepts and techniques**
LECTURE : 03h00

4 **Solar/Wind energy BP - case study**
LECTURE : 03h00

5 **Institutional financing solutions for renewable energy**
LECTURE : 03h00

6 **New financial instruments (innovation)**
LECTURE : 03h00

7 **Impacts of the financial analysis on project development**
LECTURE : 03h00

8 **Group presentation**
LECTURE : 03h00