

Number of ECTS credits : 3

Course language : English

Course leader : CHARLES AMELIE

Speakers : RONCHETTI Diego

≡ COURSE DESCRIPTION

This course allows discovering new concepts and approaches in finance from a mathematical and statistical angle, showing how most financial products originate from or rely on a quantitative basis.

The course is the natural continuation of Financial Markets, and Financial management taught in semester 1 and 2.

≡ COURSE OBJECTIVES

Quantitative finance offers a conceptual framework and mathematical tools to understand a complex and changing financial world.

The concepts and mathematical tools will be illustrated with examples and applications. A practical presentation of the main statistical and mathematical tools in Excel will also be discussed and practiced.

≡ LEARNING OBJECTIVES

C4B learning goal	LG1 - Analysis
C4B learning objective	LO2 - Analyse complex situations
Outcomes	Lev. 1 - Identify and examine the various components of a complex situation

≡ TACKLED CONCEPTS

Stock market indexes
Price adjustments
Portfolio returns, their population, and sample moments (mean, variance, skewness, kurtosis, correlation)
Semi-variance
Vale At Risk

≡ LEARNING METHODS

Exercises

≡ EXPECTED WORK AND EVALUATION

Understanding the mathematical tools

Using the appropriated tools in a specific context

≡ BIBLIOGRAPHY

Williams (2010), Introduction à la Finance Quantitative, Vuibert.
Campbell, Lo et MacKinlay (1997), The Econometrics of Financial Markets, Princeton University Press.
Anderson et al. (2016), Statistiques pour l'économie et la gestion, De Boeck.

≡ EVALUATION METHODS

70 % : Examen

30 % : Continus Assessment

1

Stock market indexes (1)

LECTURE : 02h00

- Definition of a stock market index
- Types of stock market indices
- Examples of stock market indices
- Construction of a stock market index by the most common weighting schemes

2

Stock market indexes (2)

LECTURE & CASE STUDIES & EXERCISES : 02h00

- Construction of a stock market index by the most common weighting schemes
- Practical examples in MS Excel

3

Adjustments of market prices

LECTURE & CASE STUDIES & EXERCISES : 02h00

- Corporate actions and adjustments of market prices
- Adjustments of market prices for stock splits and dividend payments
- Practical examples in MS Excel

4

Financial returns (1) and mid-term

LECTURE : 02h00

Yield and return

- Simple and logarithmic financial returns
- Mean of returns
- Mid-term (stock market indexes and adjustment of market prices)

5

Financial returns (2)

LECTURE & CASE STUDIES & EXERCISES : 02h00

- Annualization of financial returns
- Risk of returns
- Graphical representation of the financial returns by a histogram
- Practical examples in MS Excel

6

Financial returns (3)

LECTURE & CASE STUDIES & EXERCISES : 02h00

- Skewness and kurtosis of returns
- Correlation between asset returns
- Interpretation of portfolio

7

Portfolio returns and semi-variance

LECTURE & CASE STUDIES & EXERCISES : 02h00

- Portfolio's optimization
- Practical examples in MS Excel
- Further portfolio risk measures
- Population and sample semi-variance of returns
- Practical examples in MS Excel

8

Value-at-Risk

LECTURE & CASE STUDIES & EXERCISES : 02h00

- Value At Risk (VaR) of a portfolio
- VaR estimation through non-parametric and parametric methods
- Practical examples in MS Excel

