

## **ELFI M402 Derivatives**

### **Syllabus**

#### **Administrative information**

**Instructor:** Antoine LEROY

**Term:** Spring

**Number of credits and teaching hours:** 5 credits / 30 hours

**Language:** English

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#### **Learning outcomes**

Financial derivative instruments are key building blocks of the financial industry. This course aims at providing students with a general knowledge of derivatives contracts, their pricing methodologies and the practical issues encountered by derivatives professionals. Attention is also given to risk management of derivatives and the new regulations impacting the derivatives markets. Most of the course is based on the Hull book and on the Chartered Financial Analyst® program.

#### **Prerequisites**

“Back-to-basics” sections are presented during the course (e.g., discounting, duration, etc), but students are expected to have knowledge of:

- Basic calculus;
- Statistics;
- Financial theory: financial instruments (equity, bonds, etc), notions of valuation, etc.

## Course outline and other events

- Module 1 – Introduction to derivatives
- Module 2 – Forward contracts
- Module 3 – Futures
- Module 4 – Swaps
- Module 5 – Risk Management of derivatives
- Module 6 – Options – introduction, trees and strategies
- Module 7 – Options – Greeks, Black-Scholes and Monte-Carlo simulations

Students are also requested to prepare a **business case** in group. **Team presentations** are done during the course.

A **conference** by a professional in derivatives valuation is also organized, as well as the **visit of the dealing room** of a major international bank (together with various presentations by the dealing room staff).

## Evaluation

The final grade is composed of two elements:

1. Written exam: 70%;
2. Class interactivity and business case (group presentation and report): 30% (individual grade).

### 1. Exam

The written exam is a closed-book exam. The questions are quantitative exercises (pricing) and short essays related to topics discussed in class and in the material.

### 2. Business case

Groups are asked to present various business cases. Examples of previous business cases include LTCM, Lehman Brothers, SocGen, etc. They mainly cover banking and derivatives in the new paradigm (increased regulations, etc.)

Requirements:

- A presentation should last from 20 to 30 minutes.
- The group will also prepare a short written report summarizing the main messages.

## Material and references

There is a set of slides for every module. Of course, all the topics that are addressed during the course are expected to be mastered for the written exam.

The main reference is:

- John Hull, Options, Futures and Other Derivatives, 8<sup>th</sup> edition, Pearson Prentice Hall 2012.

Previous editions can also be used, but might not always be complete (e.g., chapter on the financial crisis of 2008):

- John Hull, Options, Futures and Other Derivatives, 7<sup>th</sup> edition, Pearson Prentice Hall 2008;
- John Hull, Options, Futures and Other Derivatives, 6<sup>th</sup> edition, Pearson Prentice Hall 2006.

Students are not asked to read nor master the full reference, but only the relevant chapters.

During the course, examples and solutions to exercises and case studies are presented in Excel files. All files are made available on WebCampus.

Other references present the material differently and contain other exercises and examples. They can also be used:

- Wilmott, Paul - various books;
- Chance, Don, Analysis of Derivatives for the CFA Program;
- Jorion, Philippe, Financial Risk Manager Handbook, 2d edition, Wiley, 2003;
- Cuthbertson and Nitzsche, Financial Engineering, Wiley, 2001.

Professional and regulatory articles are also used during the course. All of them can easily be found on the internet. The most important ones are made available on WebCampus.