Modèles financiers I

Lecturer
Griselda DEELSTRA (Coordinator)

Course mnemonic
ACTU-F401

ECTS credits
5 credits

Language(s) of instruction
French

Course period
First term

Campus
Plaine

Course content

Using mathematical tools, we treat the valorisation and hedging of financial instruments in discrete-time models. Next, we start with continuous-time models. First we concentrate upon static models and afterwards upon dynamical models. In particular, we study the model of Cox-Ross-Rubenstein. Finally, we concentrate upon the interest rate curve and the pricing of different interest rate derivatives in discrete time models. We also discuss annuities, loans and (coupon) bonds in a deterministic framework.

Objectives (and/or specific learning outcomes)

The goal of this course is on one hand to be able to calculate annuities, loans and prices of (coupon) bonds in a deterministic framework. On the other hand, the goal of this course is also to present financial models in discrete time stochastic frameworks for pricing and hedging of financial products. Students should well understand the probabilistic techniques used in these financial models.

Pre-requisits and co-requisits

Course having this one as pre-requisit

MEMO-F520 | Mémoire | 15 crédits

Required knowledge and skills

Probability theory, martingale theory and theory of stochastic processes in general. The course STAT-F-407 (for example) can be followed in parallel.

Teaching method and learning activities

Theoretical lectures and exercises.

Contribution to the teaching profile

See the French version for more details.

This course contributes to the well-understanding of pricing and hedging in finance and insurance (in stochastic models) and prepares upon the course of financial models in Q2, and later in Bloc 2 to the courses "Modèles financiers en assurances" and "ALM en assurances".

References, bibliography and recommended reading

DANA, R.-A. et M. JEANBLANC-PIQUE (1994). Marchés Financiers en Temps Continu. Economica.

DOTHAN, M.U. (1990). Prices in Financial Markets. Oxford University Press.

HULL, J. (1989). Options, Futures and Other Derivative Securities. Prentice-Hall, Englewood Clifs, New Yersey.

LAMBERTON, D. et LAPEYRE, B. (1997) (2nd edition). Introduction au Calcul Stochastique appliqué à la Finance. Ellipses.

MARTELLINI L. et Ph. PRIAULET (2000). Produits de Taux d'intérêt, Economica, Paris.

Course notes

Université virtuelle

Other information

Place(s) of teaching

Plaine

Contact(s)

Griselda Deelstra (O.9.110)

Evaluation method(s)

written examination

Evaluation method(s) (additional information)

The "Written examination" evaluation method can be adapted according to the sanitary situation.

Determination of the mark (including the weighting of partial marks)

The mark is based on the written exam. The questions of the theoretical part count for approximately 3/5 of the points and the questions concerning the TPs for approximately 2/5 of the points.

Main language(s) of evaluation

French

Programmes

Programmes proposing this course at the faculty of Sciences

MA-ACTU | Master in Actuarial Science | finalité Professional/unit 1 and MA-STAT | Master in Statistics : General | finalité Research General/unit 2