Course unit: Financial mathematics

- Title in French: Mathématiques financières
- Course code: tba
- ECTS credits: 2
- Teaching hours: 50h
- Type: specialized course
- Language of instruction: English
- Coordinator: Christophe Pouet
- Instructor(s): Ismail Akil (JP Morgan) , Philippe Bertrand, Abderrahim Ben Jazia (RSM France)

Brief description

This course is a specialized course for anyone interested in mathematical finance. The main topics are advanced derivatives pricing, interest rate models, numerical methods in finance and portfolio management with structured products.

Learning outcomes

- Discover more complex financial models (interest rate models, models with stochastic volality,...)
- Know how to use numerical methods to price financial product

Course content

Advanced mathematical finance

1. Local volatility models (Dupire, CEV)
2. Stochastic volatility models (Heston, SABR)
3. Interest rate models (Vasicek, Hull&White, Cox-Ingersoll-Ross)
4. Princing with Matlab

Advanced portfolio management

1. The principles of portfolio insurance
2. Three basic methods (Stop-loss, CPPI, OBPI)
3. Dynamic management and simulations

Bibliography

- Bertrand, P. et Prigent, J.-L., “Gestion de portefeuille : analyse quantitative et gestion structurée” , Economica, 2006.
- Lamberton, D. and B. Lapeyre, “Introduction to Stochastic Calculus Applied to Finance”, 2nd ed., Chapman and Hall/CRC, 2007

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