

# 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 volatility,...)
- 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. Pricing 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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