

## Credit default risk

ECTS : 3

### Description du contenu de l'enseignement :

1. Idiosyncratic credit risk
2. Credit portfolio risk
3. Monte Carlo simulations for credit portfolios
4. Risk contributions and portfolio management
5. Collateralized debt obligations
6. Advanced Monte Carlo simulation techniques

### Compétence à acquérir :

- Understand the definition of single name credit default risk and how it is measured
- Understand the risk aggregation problem and be able to program a Monte Carlo simulator for credit portfolios
- Understand the risk allocation problem and be able to calculate risk contributions to portfolio measures of risk
- Understand how CDS & CDOs can be used to manage credit portfolio risk and be able to calculate their impact by Monte Carlo simulation
- Understand the concept of Monte Carlo variance reduction and be able to implement importance sampling

### Mode de contrôle des connaissances :

- Graded project
- Class participation

### Bibliographie, lectures recommandées :

- **Introduction to Credit Risk Modeling** (Chapman and Hall/CRC Financial Mathematics Series) 2nd Edition by Christian Bluhm, Ludger Overbeck and Christoph Wagner
- **Monte Carlo Methods in Financial Engineering** (Springer) by Paul Glasserman
- **Quantitative Risk Management** (Princeton Series in Finance) by Alexander McNeil, Rudiger Frey and Paul Embrechts