Quantitative Management of Risk				
Hours		Status	Term	Audience
Lectures	Tutorials			
15	0	Compulsory	10	M2 ISF
Lecturer		Evaluation	Weight	ECTS
Ali Skalli		Project	2	2.5

Abstract:

The first part of this lecture discusses the main statistical properties of risk measures such as the *Value at Risk* (VaR) and the *Expected Shortfall* (ES) as well as financial series modelling techniques aiming at estimating VaR and ES (GARCH-type models, Generalized Pareto Distribution, Gaussian Mixtures). *Backtesting* procedures are then introduced and their performances in judging the reliability of VaR and the accuracy of the underlying VaR models, are discussed. The final part of this lecture introduces copulas as a means of modelling the joint distributions of financial returns. A number of copulas are discussed and their properties, highlighted. It is also shown how copulas allow portfolio simulations and estimation of the corresponding VaR measures.

Description:

- Risk Measures
  - *Value at Risk*
  - Expected Shortfall
  - Other Risk Measures
- Modelling Financial Returns in a Context of Fat Tails
  - The Generalized Pareto Distribution
  - Gaussian Mixtures
- *Backtesting*
  - B*acktesting*
  - *Backtesting* and Financial Regulation
- Copulas
  - Tail Correlation and Exceedence Probabilities
  - Copula families
  - Portfolio Simulation

Teaching method:

- Lectures and illustrations based on using the SAS software

Prerequisites:

- Joint distribution functions, Linear and non-linear time series analysis.

References (*Textbooks only*)**:**

- Brooks, Ch. (2002), *Introductory Econometrics for Finance*, Cambridge University Press.
- Campbell, J. Y., A. W. Lo et A. C. MacKinley (1997), *The Econometrics of Financial Markets*, Princeton University Press, Princeton, New Jersey.
- Nelsen, R. B. (2006), *An Introduction to Copulas*, Springer Series in Statistics, 2ème édition.