FIN-417

Quantitative financial risk management

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Cursus	Sem.	Type
Computational science and Engineering	MA1, MA3	Opt.
Computational science and engineering minor	H	Opt.
Financial engineering minor	H	Opt.
Financial engineering	MA1, MA3	Obl.

Language of teaching	English
Credits	4
Session	Winter
Semester	Fall
Exam	Written
Workload	120h
Weeks	14
Hours	**4 weekly**
Courses	2 weekly
Exercises	2 weekly
Number of positions	

Summary

This course is an introduction to quantitative risk management that covers standard statistical methods, multivariate models, risk measures, non-linear dependence structures (copula models), as well as credit risk.

Content

- Basics of risk management
- Standard statistical methods
- Risk measures
- Multivariate models
- Finacial time-series
- Modelling dependencies (correlation, copula)
- Extreme value theory
- Credit risk

Keywords

risk management, risk measure, dependence, diversification, credit risk

Learning Prerequisites

Required courses

- Calculus and Linear Algebra (undergraduate level)
- Statistics and Probability (first university course)

- Knowledge of financial derivatives

Recommended courses

Learning Outcomes

By the end of the course, the student must be able to:

- Use the main statistical tools used to model financial risk
- Implement important volatility and credit risk models
- Choose appropriate tools to describe and quantify the risk of a portfolio

Transversal skills

- Use a work methodology appropriate to the task.

Teaching methods

- Lectures
- Exercises
- Projects

Expected student activities

active attendance at lectures, completing exercises and projects

Assessment methods

- 25% project
- 75% final exam

Resources

Virtual desktop infrastructure (VDI)

No

Bibliography

- Quantitative Risk Management - McNeil, Frey, Embrechts (primary reference)

- Handbook of Financial Risk Management - Roncalli

Ressources en bibliothèque

- Find the references at the Library

Moodle Link

- https://go.epfl.ch/FIN-417