

Risk Theory

Christian-Yann Robert – Ensaé Paris - Crest

Course : 15 hours - TP : 6 hours

Objectives

The purpose of this course is to present the basic mathematical concepts of damage insurance. The objective of Risk Theory is to provide theoretical models of the cost and number of claims in order to deduce the associated risk and to price insurance contracts.

At the end of this course, students should be able to :

- Use the individual and collective model of claims occurrence in non-life insurance.
- Apply the collective model to resinsurance.
- Compare risks and use risk measures, including Value-at-Risk (VaR)
- Understanding the Poisson process and its application in ruin theory

Outline

- Preliminaries - Recalls, generator functions.
- Insurance models - Individual model, collective model.
- Risk comparison.
- Premium principle and risk measurement.
- Theory of ruin - Poisson process, Lundberg model, probability of ruin.

Bibliography

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- Z. Tan and P. Tankov, Optimal trading policies for wind energy producer, preprint (2016).
- Bensoussan, Alain, and Alexandre Brouste, Cox–Ingersoll–Ross model for wind speed modeling and forecasting. Wind Energy (2015).
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