

Announcement SoSe 2025

Lecture in Mathematical Finance

Stochastic models for tariff calculation, loss reserving and reinsurance and their applications

Dr. Gerhard Quarg

Area: / Modulnr.: Actuarial Science / MA5736

Course Structure: Lecture: 2h

Content: Stochastic models for tariff calculation, loss reserving and reinsurance; basics: parameter estimation and model validation, individual model and collective model; tariffs: determination of tariff classes by cluster analysis, selection of tariff variables using test statistics, premium calculation in structured tariffs with maximum likelihood; loss reserving: properties of loss reserving methods as incremental loss ratio, chain ladder, Bornhuetter/Ferguson, uncertainty of the loss reserve, calculation of the mean squared error of prediction; risk sharing and reinsurance: reasons, forms, consequences for the loss variables, pricing, optimality considerations.

Prerequisite: MA0009 Introduction to Probability and Statistics, MA3405 Insurance Mathematics 1 (helpful: MA2409 Probability Theory)

Literature: **Heinz-Willi Goelden, Klaus Hess, Martin Morlock, Klaus Schmidt, Klaus Schröter:** Schadenversicherungsmathematik. Springer, (2016)
Thomas Mack: Schadenversicherungsmathematik. Vol.28. Verlag Versicherungswirtschaft.(1997)
Wüthrich, M. and Merz, M. (2008). Stochastic Claims Reserving. Wiley, New York.

Certificate: Exam, 3 CP

Location/ Lecture: See TUMonline