Lehrstuhl für Finanzmathematik
Fakultät für Mathematik
Technische Universität München

Announcement WiSe 2022/23
Lecture in Insurance Mathematics
Actuarial Risk Theory

Prof. Dr. Matthias Scherer

Area: / Modulnr.: Insurance Mathematics / MA3442

Course Structure: Lecture: 2h Exercises: 1h

Content:
I) Some auxiliary tools
a. Probability generating functions
b. Recursion formula for convolutions
c. Moment generating functions
d. Comparing risks
II) The collective model
III) The risk process
a. Poisson process
b. Compound Poisson process
IV) Ruin theory in the classical risk model
a. Renewal theory
b. The Pollaczek-Khinchine formula
c. Asymptotic estimates of the ruin probability

Audience: MSc Mathematics, Mathematical Finance and Actuarial Science

Prerequisite: MA2402 Basic Statistics, MA2409 Probability Theory, MA4405 Stochastic Analysis, MA3405 Insurance Mathematics I

Literature:
Asmussen, S. (2000): Ruin Probabilities. Word Scientific, Singapur.
Bühlmann, H. (2007): Mathematical Methods in Risk Theory. 2nd ed. Springer, Berlin.
Embrechts, P., Klüppelberg, C. and Mikosch, T. (1997): Modelling Extremal Events for Insurance and Finance. Springer, Berlin.
Kyprianou, A.E. (2014): Fluctuations of Lévy Processes with Applications: Introductory Lectures. 2nd ed. Springer, Berlin.
Mikosch, T. (2003): Non-Life Insurance Mathematics. Springer, Berlin.
Resnick, S.I. (2002): Adventures in Stochastic Processes. 3rd ed. Birkhäuser, Boston.

Certificate: Exam, 5 CP

Location and Time: See TUMonline