Forschungsgruppe Finanz- und Versicherungsmathematik
TUM School of Computation, Information and Technology
Technische Universität München

TUM

Announcement WiSe 2024/25
Lecture in Actuarial Science

Mathematics of Reinforcement Learning

Prof. Dr. Christoph Knochenhauer

Area: / Modulnr.:	Department Mathematics / CIT413036
Course Structure:	Lecture: 2h Exercises: 2h
Content:	The course gives an overview of the mathematical foundations of reinforcement learning, including an introduction to Markov decision processes and tabular reinforcement learning methods (Monte Carlo, temporal difference learning, SARSA, Q-Learning, ...). These topics are complemented by an introduction to stochastic approximation theory to the extent of performing a convergence analysis of the algorithms.
Prerequisite:	MA0001 Analysis 1, MA0002 Analysis 2, MA0004 Linear Algebra 1, MA0009 Introduction to Probability Theory and Statistics, MA2409 Probability Theory
Literature:	**Sutton, Barto (2018):** Reinforcement Learning: An Introduction, MIT Press **Puterman (1994):** Markov Decision Processes: Discrete Stochastic Dynamic Programming, Wiley **Kushner, Yin (2010):** Stochastic Approximation and Recursive Algorithms and Applications, Springer
Certificate:	see TUMonline
Location/ Lecture/Exercises:	see TUMonline