Applied Discrete Modelling

Winter

(in German: Applied Discrete Modelling)

Module-ID: FIN-INF-120279

Abbreviation	Credit Points	Semester	Term	Duration	Language	Level
ADM	6	Winter	starting at 1.	1 Semester	english	Master

Link:	LSF
Limited accessability:	
Responsibility:	PD Dr. Claudia Krull
Lecturer:	PD Dr. Claudia Krull
Classes:	• Lecture *Applied Discrete Modelling* • Exercise class *Applied Discrete Modelling*
Applicability in curriculum:	- M.Sc. INF: Informatik - M.Sc. INF: Informatik Wahlpflicht (SPO 2027) - M.Sc. INGINF: Informatik - M.Sc. WIF: Informatik - M.Sc. WIF: Informatik Wahlpflicht (SPO 2027) - M.Sc. DKE: Learning Methods and Models for Data Science - M.Sc. DE: Fachliche Spezialisierung - M.Sc. DE: Informatik Wahlpflicht (SPO 2027) - M.Sc. VC: Computer Science - M.Sc. VC: Computer Science (SPO 2027)

Intended learning outcomes:

- Students understand the basics of Markov chains and know selected applications and solution methods

- Students understand non-Markovian stochastic processes and can model and simulate them in different ways
- Students understand hidden Markovian and non-Markovian processes
- Students know selected research topics of the research group
- Students can implement the models and methods they have learned and apply them to problems from the university's main research areas, in particular medicine and engineering

Content:

- Discrete-time and continuous-time Markov chains
- Applications and implementation of solution methods for Markov chains
- Method of supplementary variables
- Proxel simulation and phase distributions
- Modeling with hidden models
- Programming solution methods for different model classes
- Modeling and solving problems from medicine and engineering

Workload:
56 h lectures and exercise classes
124 h independent work

Pre-examination requirements:	**Type of examination:**	**Teaching method / lecture hours per week (SWS):**
Solutions to Assignments 1-6 need to be handed in before the exam.	Oral Exam 30 Minutes	• Lecture 2 SWS • Exercise class 2 SWS

Prerequisites according to examination regulations:	**Recommended prerequisites:**
none	• Engineering mathematics • Computer programming

Media:	**Literature:**
recorded lectures and exercises are available	

Comments:

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