# 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:** | false |
| **Responsibility:** | PD Dr. Claudia Krull |
| **Lecturer:** | PD Dr. Claudia Krull |
| **Classes:** | • Lecture *Applied Discrete Modelling*<br>• Exercise class *Applied Discrete Modelling* |
| **Applicability in curriculum:** | - M.Sc. INF: Informatik<br>- M.Sc. INF: Informatik Wahlpflicht (SPO 2027)<br>- M.Sc. INGINF: Informatik<br>- M.Sc. WIF: Informatik<br>- M.Sc. WIF: Informatik Wahlpflicht (SPO 2027)<br>- M.Sc. DKE: Learning Methods and Models for Data Science<br>- M.Sc. DE: Fachliche Spezialisierung<br>- M.Sc. DE: Informatik Wahlpflicht (SPO 2027)<br>- M.Sc. VC: Computer Science<br>- 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<br>• Exercise class 2 SWS |

| **Prerequisites according to examination regulations:** | **Recommended prerequisites:** |
|---|---|
| none | • Engineering mathematics<br>• Computer programming |

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

**Comments:**

Revision #1
Created 2026-11-19 09:59:05 UTC by Fakultät für Informatik
Updated 2026-11-19 09:59:05 UTC by Fakultät für Informatik