

Overview Courses¹
Master Computational Mathematics
Winter Term 2026/27

Compulsory Modules:

Seminars 1 & 2:

- **Advanced Seminar Dynamical Systems** (Prof. Dr. Wirth)
- **Advanced Topics in Combinatorics** (Prof. Dr. Glock)
- **Discrete Stochastic Processes** (PD Dr. Gilch)
- **Functional Analysis** (Prof. Dr. Prochno, Dr. Krieg)
- **Fourier and Wavelet Analysis through Linear Algebra** (Prof. Dr. Forster-Heinlein)
- **Logic and Geometry** (Prof. Dr. Kaiser, Prof. Dr. Müller)
- **Monte Carlo Methods and Applications** (Prof. Dr. Rudolf)
- **NOCAS** (Prof. Dr. Kreuzer)
- **Optimization and Game Theory with Applications in Traffic Networks** (Prof. Dr. Harks)
- **Selected Chapters from Stochastics** (Prof. Dr. Müller-Gronbach)

Module Group: “Algebra, Geometry and Cryptography”:

Algebraic Combinatorics (Dr. Petr)

Computer Algebra (Prof. Dr. Kreuzer)

Seminar:

- **Logic and Geometry** (Prof. Dr. Kaiser, Prof. Dr. Müller)
- **NOCAS** (Prof. Dr. Kreuzer)

¹No guarantee on completeness and correctness.

Module Group: “Mathematical Logic and Discrete Mathematics”:

Algebraic Combinatorics (Dr. Petr)

Algorithmic Graph Theory and Perfect Graphs (Prof. Dr. Rutter)

Algorithms under Uncertainty (Dr. Opris)

Distributed Algorithms (Dr. Ghodselahi)

Mathematical Logic (Prof. Dr. Müller)

Parameterized Algorithms (Prof. Dr. Rutter)

Randomised Algorithms (Prof. Dr. Sudholt)

Seminar:

- **Advanced Topics in Combinatorics** (Prof. Dr. Glock)
- **Logic and Geometry** (Prof. Dr. Kaiser, Prof. Dr. Müller)

Module Group: “Analysis, Numerics and Approximation Theory”:

Advanced Imaging (Prof. Dr. Sauer)

Asymptotic Geometric Analysis and Applications (Prof. Dr. Prochno)

Fourier and Laplace Transforms (Prof. Dr. Forster-Heinlein)

Functional Analysis (Prof. Dr. Prochno)

Introduction to Information-based Complexity and Compressed Sensing
(Dr. Krieg)

Seminar:

- **Functional Analysis** (Prof. Dr. Prochno, Dr. Krieg)
- **Fourier and Wavelet Analysis through Linear Algebra** (Prof. Dr. Forster-Heinlein)

Module Group: “Dynamical Systems and Optimization”:

Computational Game Theory (Prof. Dr. Harks)

Distributed Algorithms (Dr. Ghodselahi)

Partial Differential Equations (Prof. Dr. Wirth)

Seminar:

- **Advanced Seminar Dynamical Systems** (Prof. Dr. Wirth)
- **Optimization and Game Theory with Applications in Traffic Networks** (Prof. Dr. Harks)

Module Group: “Stochastics, Statistics”:

Mathematical Statistics (Prof. Dr. Müller-Gronbach)

Slice Sampling (Prof. Dr. Rudolf)

Seminar:

- **Discrete Stochastic Processes** (PD Dr. Gilch)
- **Monte Carlo Methods and Applications** (Prof. Dr. Rudolf)
- **Selected Chapters from Stochastics** (Prof. Dr. Müller-Gronbach)

Modulgruppe: “Data Analysis and Data Management and Programming”:

Algorithms under Uncertainty (Dr. Opris)

Computational Linguistics Shared Task Lab (Prof. Dr. Hautli-Janisz)

Introduction to Deep Learning (Prof. Dr. Lemmerich)

Randomised Algorithms (Prof. Dr. Sudholt)

Scaling Database Systems (Prof. Dr. Scherzinger)

Modulgruppe: “Applications”:

Econometric Methods (Prof. Dr. Haupt)

Financial Engineering and Structured Finance (Prof. Dr. Entrop)

Foundations of Econometrics (Prof. Dr. Haupt)

Marketing Research – Retake Exam (Prof. Dr. Schindler)

Quantitative Methods in Finance (Prof. Dr. Entrop)