

Overview Courses¹

Master Computational Mathematics

Summer Term 2023

Module Group: “Algebra, Geometry and Cryptography”:

Computational Geometry (Dr. Desai)

Cryptography (Dr. Le)

Elliptic Curves (Prof. Dr. Zumbrägel)

Seminar:

- **Classical and Post-Quantum Cryptography** (Prof. Dr. Zumbrägel)
- **NOCAS** (Prof. Dr. Kreuzer)
- **Pure Mathematics** (Prof. Dr. Außenhofer, Prof. Dr. Kaiser, Prof. Dr. Müller)

Module Group : “Mathematical Logic and Discrete Mathematics”:

Constraint Satisfaction Problems (Prof. Dr. Müller)

Discrete Mathematics (Prof. Dr. Glock)

Effiziente Algorithmen (Prof. Dr. Rutter)

Extremal Combinatorics (Gupta)

Fortgeschrittene Komplexitätstheorie (Prof. Dr. Müller)

Mathematische Logik (Prof. Dr. Müller)

Theory of Randomised Search Heuristics (Prof. Dr. Sudholt)

Seminar:

- **Pure Mathematics** (Prof. Dr. Kaiser, Prof. Dr. Außenhofer)
- **Spectral Graph Theory** (Prof. Dr. Glock)

¹No guarantee on completeness and correctness.

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

Advanced Imaging (Prof. Dr. Sauer)

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

Funktionalanalysis (Prof. Dr. Prochno)

Seminar:

- **Funktionalanalysis** (Prof. Dr. Prochno)
- **The Cauchy-Schwarz Master Class** (Prof. Dr. Forster-Heinlein)

Module Group: “Dynamical Systems and Optimization”:

Computational Game Theory (Prof. Dr. Harks)

Computational Geometry (Dr. Desai)

Machine Learning Control and Optimization (Prof. Dr. Wirth)

Seminar:

- **Algorithmische Optimierung** (Prof. Dr. Harks)
- **Advanced Seminar Dynamical Systems** (Prof. Dr. Wirth)
- **Optimierung und Spieltheorie** (Prof. Dr. Harks)
- **Learning and Game Theory** (Prof. Dr. Harks)

Module Group: “Stochastics, Statistics”:

Computational Statistics - Regression in \mathbf{R} (Dr. Schnurbus)

Computational Statistics - Statistical Learning in \mathbf{R} (Dr. Schnurbus)

Numerical methods for stochastic differential equations (Prof. Dr. Müller-Gronbach)

Paneldatenanalyse (Dr. Fritsch)

Topics in Applied Econometrics (Prof. Dr. Haupt)

Seminar:

- **Applied Statistics - Regression & Forecasting** (Prof. Dr. Haupt)
- **Mathematical Data Science** (Prof. Dr. Rudolf)
- **Monte Carlo Methods and Applications** (Prof. Dr. Rudolf)
- **Selected Chapters from Stochastics** (Prof. Dr. Müller-Gronbach)

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

Computational Linguistics (Prof. Dr. Hautli-Janisz)

Deep Learning for Natural Language and Code (Prof. Dr. Herbold)

Effiziente Algorithmen (Prof. Dr. Rutter)

Machine Learning Lab (Prof. Dr. Granitzer)

Multimedia Databases (Prof. Dr. Kosch)

Practical Parallel Programming (Dr. Größlinger)

Principles of Data Organisation (Prof. Dr. Scherzinger)

Theory of Randomised Search Heuristics (Prof. Dr. Sudholt)

Modulgruppe: “Applications”:

Advanced Topics in Management Science: Planning of Complex Interacting Systems (Prof. Dr. Otto)

Corporate Finance und Kapitalmärkte (Prof. Dr. Entrop)

Marketing Research (Prof. Dr. Totzek)

Practical Course: Advanced Topics in Management Science (Prof. Dr. Otto)

Quantitative Methoden in Finance (Prof. Dr. Entrop)