

Basic structure

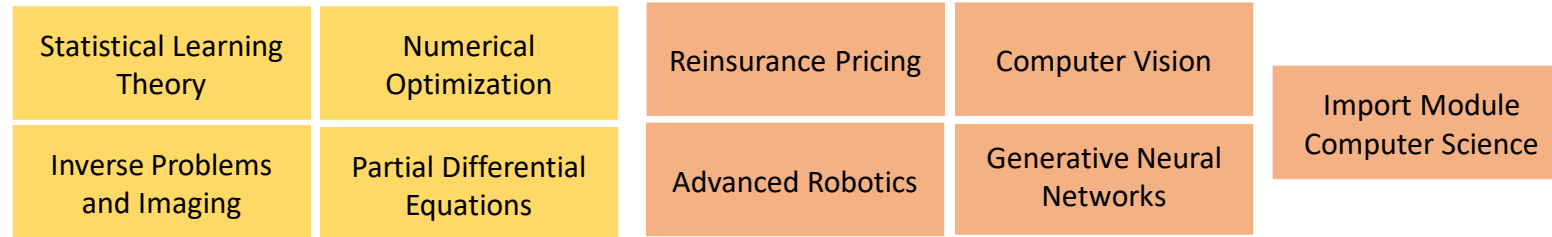
- 3 semesters
- Advanced and Application Modules (10 in total, min. 4 adv., min. 3 appl.)
- Practice orientated: Integrated Project, Seminars, Project Management Module, instructors from industry
- (most) modules contribute 5 credits (ECTS), 90 credits in total

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	Advanced Module 1					Advanced Module 2					Advanced Module 3					Application Module 1					Application Module 2					Project				
2	Advanced Module 4					Advanced Module 5					Advanced Module 6					Application Module 3					Application Module 4					Main Seminar				
3	Master Thesis and Seminar																									Modern Project Management				

Three major areas of application:

- Finance and Actuarial Science
- Industrial Mathematics
- AI and Information Technology

Examples:



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
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Research option

- 2 modules (1 adv. + 1 appl.) may be substituted by a research project.
- Up to 2 research projects.
- Supervised by an instructor.
- Research projects can be carried out externally at companies.

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1	Advanced Module 1					Advanced Module 2					Application Module 1					Research Project 1					Project									
2	Advanced Module 3					Advanced Module 4					Application module 2					Research Projekt 2					Main Seminar									
3	Master Thesis and Seminar																									Modern Project Management				

The course covers foundations in:

- Probability Theory, Statistics and Stochastic Analysis
- Numerical Mathematics and Optimisation
- Algebra and Discrete Mathematics
- Complex Analysis
- Functional Analysis and Partial Differential Equations

Fields of application covered:

- Actuarial Science/ Financial Mathematics
- AI and Data Science
- Modelling and Simulation
- Information and Communication Technology
- Image and Signal Processing
- Robotics and Production

Advanced modules (examples)

- Partial Differential Equations
- Inverse Problems and Imaging
- Statistical Learning Theory
- Numerical Optimisation
- Nonlinear Optimisation
- Stochastic Processes
- Public Key Cryptography
- Coding Theory
- Modelling and Simulation
- Finite Element Method
- ...

Application modules (examples)

- Advanced Robotics
- Computer Vision
- Generative Neural Networks
- IT Security
- Reinsurance Pricing
- Risk Theory
- Financial Market Models
- Option Pricing
- Operation Research
- Fluid Dynamics
- Comp. Science modules (AI + div. topics)
- Industrial Applications (div.)