

Overview CSiS Curriculum based on Examination Regulations 2020

Pflichtbereich / Compulsory Subjects

Term	Computer Simulation	Computer Science	Numerical Methods
1 (WiSe) 28 CP	Computer Simulation 1 11 CP Lab Course I 150h Introduction to Computer Simulation 120h Block Course on Mathematical Foundations 60h	Computer Science 1 9 CP Modern Programming 180h Virtualization I 90h or Introduction to HPC 90h	Numerical Methods 1 8 CP Numerical Analysis and Simulation I 240h
2 (SoSe) 24 CP	Computer Simulation 2 13 CP Data Analysis 150h Parallel Algorithms 240h	Computer Science 2 3 / 7 CP Tools 90h	Numerical Methods 2a / 2b 8 CP Numerical Methods 2a: Numerical Analysis and Simulation II 240h or Numerical Methods 2b: Numerical Methods in Classical Field Theory and Quantum Mechanics 240h
3 (WiSe) 22 CP	Computer Simulation 3 12 CP Introduction to Computer Simulation II 120h Lab Course II 240h	Computer Science 2 (contd.) 4 / 7 CP Image Processing and Data Visualization 120h or Virtualization II 120h	Numerical Methods 3 6 CP Numerical Linear Algebra 180h

Table 1: Overview CSiS Curriculum: Obligatory Subjects

Overview CSiS Curriculum – Wahl-Pflichtbereich / Elective Subjects

Term	Atmospheric Physics	Computational Electromagnetics	Computational Finance	Computational Fluid Mechanics
1 (WiSe)				CFM1 4/ 8 CP Computational Fluid Dynamics 120h
2 (SoSe)	AtmP1 8 CP Summer School on Chemistry and Dynamics of the Atmosphere (Jülich) 150h 8 CP Selected Topics in Atmospheric Physics 90h or Atmospheric Modelling 90h	CEM1 8 CP Computational Electromagnetics 1 240h	CompFin1 8 CP Computational Finance 1 270h	CFM1 (contd.) 4 /8 CP Multiphase Flows 120h
3 (WiSe)	EAP /AtmP2b 8 CP EAP: Introduction to Atmospheric Physics 240h or AtmP2b: Selected Topics in Atmospheric Physics 150h Seminar on Atmospheric Physics 90h	CEM2 8 CP Computational Electromagnetics 2 240h (CEM-Lab Project)	CompFin2 8 CP Computational Finance 2 270h	CFM 2- 5 8 CP CFM2: Pedestrian Dynamics 120h CFM3: Smooth Particle Hydrodynamics 120h CFM4: Free Surface Water Flow 120h CFM5: Fire Simulation 120h
4 (SoSe) 30 CP	Master Thesis 30 CP			

Table 2: Overview CSiS Curriculum: Elective Subjects (cont.)

Overview CSiS Curriculum – Wahl-Pflichtbereich / Elective Subjects

Term	Experimental Particle Physics	Imaging in Medicine	Materials Science	Theoretical Chemistry	Theoretical Particle Physics
1 (WiSe)					
2 (SoSe) 8 CP	SMTp 8 CP The Standard Model of Elementary Physics 240h	IMG1 8 CP Introduction to Imaging and Tomographic Imaging + Seminar 240h	SMwM 8 CP Concepts in Soft Matter Physics 240h	TC1 8CP Quantum Theory of Molecules 240h	SMTp /SFT /VTT 8 CP SMTp: The Standard Model of Elementary Particle Physics 240h or SFT: Statistical Field Theory 240h or VTT: Many Particle Theory 240h
3 (WiSe) 8 CP	COS /DET /GETA 8 CP COS: Introduction to Cosmology and General Relativity + Seminar 240h or DET: Detector Physics 240h or GETA - Foundations of Elementary Particle and Astroparticle Physics 240h	IMG2 /DET 8 CP IMG2: Image Processing and Data Visualization + Seminar 240h or DET: Detector Physics 240h	NMvM 8CP Computational Materials Science 240h	TC2 8 CP Theoretical Chemistry Applications 240h	COS /EQFT /FGM 8 CP COS: Introduction to Cosmology and General Relativity + Seminar 240h or EQFT: Introduction to Quantum Field Theory 240h or FQM: Advanced Quantum Mechanics 240h
4 (SoSe) 30 CP	Master Thesis 30 CP				

Table 3: Overview CSiS Curriculum: Elective Subjects (cont.)