Overview CSiS Curriculum based on Examination Regulations 2020 3rd amendment 13.11.2023

Pflichtbereich / Compulsory Subjects

Term	Computer Simulation		Computer Science		Numerical Methods	
1	**Computer Simulation 1***	**11 CP**	**Computer Science 1**	**9 CP**	**Numerical Methods 1**	**8 CP**
(WiSe)	Lab Course I	150h	Modern Programming	180h	NM1-a: Numerical Analysis and Simulation I	240h
	Introduction to Computer Simulation	120h	Virtualization I	90h	or	
28 CP	Block Course on Mathematical Foundations	60h	or		NM1a: Advanced Numerics	240h
			Introduction to HPC	90h	with components: a + b or a + c	
2	**Computer Simulation 2**	**13 CP**	**Computer Science 2**	**3 /7 CP**	**Numerical Methods 2a /2b**	**8 CP**
(SoSe)	Data Analysis	150h	Tools	90h	Numerical Methods 2a: Numerical Analysis and Simulation II	240h
	Parallel Algorithms	240h			or	
24 CP					Numerical Methods 2b: Numerical Methods in Classical Field Theory and Quantum Mechanics	240h
3	**Computer Simulation 3***	**12 CP**	**Computer Science 2 (contd.)**	**4 /7 CP**	**Numerical Methods 3**	**6 CP**
(WiSe)	Introduction to Computer Simulation II	120h	Image Processing and Data Visualization	120h	Numerical Linear Algebra	180h
22 CP	Lab Course II	240h	or			
			Virtualization II	120h		

Table 1: Overview CSiS Curriculum: Obligatory Subjects

*final module exam with limited repeatability: 3 attempts in total

Overview CSiS Curriculum – Wahl-Pflichtbereich / Elective Subjects

Term	Atmospheric Physics	Computational Electromagnetics	Computational Finance	Computational Fluid Mechanics
1 (WiSe)				
2 (SoSe) **8 CP**	**AtmP1** **8 CP** Summer School on Chemistry and Dynamics of the Atmosphere (Jülich) 150h Selected Topics in Atmospheric Physics 90h or Atmospheric Modelling 90h	**CEM1** **8 CP** Computational Electromagnetics 1 240h	**CompFin1** **8 CP** Computational Finance 1 240h	**CFM1.1*** **4 CP** Computational Fluid Dynamics 120h
3 (WiSe) **8 CP**	**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 (CEM-Lab Project) 240h	**CompFin2** **8 CP** Computational Finance 2 240h	**CFM1.2*** **4 CP** Radiative Heat Transfer 120 h **CFM 2- 5 (choice of two):** **8 CP** **CFM2:** Pedestrian Dynamics 120h **CFM3:** tba 120h **CFM5:** Fire Simulation 120h
4 (SoSe) 30 CP	**Master Thesis 30 CP****			

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

*CFM1.1: final module exam with limited repeatability: 3 attempts in total; exam registration only possible if the module CSim1 has been successfully passed.
*CFM1.2: final module exam with limited repeatability: 3 attempts in total; exam registration only possible if the modules CSim1 and CFM1.1 have been successfully passed.
** CFM: module exams CFM1.1 and CFM1.2 must have been successfully passed for registration of Master Thesis.

Overview CSiS Curriculum – Wahl-Pflichtbereich / Elective Subjects

Term	Detector Physics	Imaging in Medicine	Molecular and Materials Modelling	Theoretical Particle Physics
1 (WiSe)				
2 (SoSe) **8 CP**	**PDP** **8 CP** Particle Detector Project 240h	**IMG1** **4/8 CP** Quantitative Medical Imaging 120h	**MMM1** **8CP** Molecular and Materials Modelling 1 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**	**DET** **8 CP** DET: Detector Physics 240h	**IMG1** **4/8 CP** TPDP-a Detector Physics + TPDP-b Exercises Detector Physics 120h **IMG2** **8 CP** IMG2: Image Processing and Data Visualization + Seminar 240h	**MMM2** **8 CP** Molecular and Materials Modelling 2 240h	**COS /EQFT /FQM** **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.)

last update: 17.04.2024