

(Compulsory) Elective Subjects (WP-Modules)

Mathematics

	Module Name	ECTS	Prüfungsnummer	Semester
	Functional Analysis	5	32301 / 32302	WS
	Optimierung für Ingenieure	7.5	40501 / 40502	SS
	Elementary Numerics for Engineers	7.5	40602	WS
	Numerical Linear Algebra	7.5	950103	WS
	Multigrid Methods	5	35601	SS
	Einführung Numerik PDE	10	52401 / 52402	WS

Computer Science

	Module Name	ECTS	Prüfungsnummer	Semester
	Programming Techniques for Supercomputers	7.5	278169	SS
	Simulation und wissenschaftliches Rechnen 2	7.5	684900	SS
	High End Simulation in Practice	7.5	45101	SS
	Architekturen von Superrechnern	5	44601	SS
	Computational Optics	7.5	768903	SS
	Advanced Simulation Technology	5		WS
	Heterogeneous Computer Architectures	5		WS
	Softwarearchitektur	10	453543	SS
	Cyber-Physical Systems	5	44701	WS/SS
	HPC Software Project	10	695344	SS
	Advanced Programming Techniques	7.5	465562	WS
	Interventional Medical Image Processing	7.5	37601	SS
	Computer Graphics	5	38201	WS
	Image Processing in Optical Nanoscopy	5	289629	SS
	Smart Grid	5	623734	WS
	Fahrzeugkommunikation	5	716033	SS
	The AMOS Project	5	753997	SS

Technical Application Field: IT / MT

	Module Name	ECTS	Prüfungsnummer	Semester
	Digitale Signalverarbeitung	5	35001	WS
	Informationstheorie	5	36001	SS
	Convex Optimization in Communication and Signal Processing	5	772738	WS
	Statistical Signal Processing	5	64301	SS

Technical Application Field: IT / DSP

	Module Name	ECTS	Prüfungsnummer	Semester
	Multimedia Communications I	5	63101	WS
	Multimedia Communications II	5	44801	WS
	Speech and Audio Signal Processing	5	64601	SS
	Multidimensional Signals and Systems	5	68401	
	Signalanalyse	2.5	250058	WS
	Transform. in der Signalverarbeitung	2.5	498723	
	Image and Video Compression			
	Adv. Topics in Perceptual Audio Coding			
	Audiovisual Scenes			
	Music Processing - Synthesis			

Technical Application Field: Information Technology – DT

	Module Name	ECTS	Prüfungsnummer	Semester
	Digital Communications	5	78001	WS
	Fundamentals of Mobile Communications	5	31401	
	Channel Coding			
	Advanced Topics in Information Theory			
	Transmission and Detection for Advanced Mobile Communications	2.5	34201	
	MIMO Communication Systems	5	63001	
	Radio Resource Allocation in Advanced Cellular Networks			
	Equalization and Adaptive Systems for Digital Communications			
	Optical Transmission Systems			

Technical Application Field: Medical Engineering

	Module Name	ECTS	Prüfungsnummer	Semester
	Digitale Signalverarbeitung	5	35001	WS
	Multidimensional Signals and Systems	5	68401	
	Praktikum Vertiefung Medizinische Biotechnologie - Bildverarbeitung	2.5		SS
	Optical Technologies in Life Science	5	922257	WS
	Clinical Applications of Optical Technologies and Associated Fundamentals of Anatomy	5		

Technical Application Field: Solid Mechanics and Dynamics

	Module Name	ECTS	Prüfungsnummer	Semester
	Numerische Methoden in der Mechanik	5	74401	WS / SS
	Computational Dynamics	5	44501	WS
	Materials Modeling and Simulation	5		SS
	Lineare Kontinuumsmechanik	5	71301	WS
	Nichtlineare Kontinuumsmechanik	5		SS
	Nichtlineare Finite Elemente	5	42601	WS

Technical Application Field: Thermo and Fluid Dynamics

	Module Name	ECTS	Prüfungsnummer	Semester
	Numerische Methoden der Thermofluidmechanik I	7.5		WS
	Numerische Methoden der Thermofluidmechanik II	7.5		SS
	Physik der Turbulenz und Turbulenzmodellierung I	5	52201	WS
	Mikrofluiddynamik	5		WS
	Angewandte Thermofluiddynamik	5	52901	WS

Technical Application Field: Automation Control

	Module Name	ECTS	Prüfungsnummer	Semester
	Nichtlineare Systeme			
	Mehrgrößen-Zustandsregelung			

Technical Application Field: Mechatronics

	Module Name	ECTS	Prüfungsnummer	Semester
	CAE von Sensoren und Aktoren	2.5	60811	WS
	Turbomaschinen	5		WS
	Numerische Simulation Elektromechanischer Wandler	7.5	668903	SS
	Numerische Strömungsmechanik I	7.5		SS
	Technische Akustik	5	23601	SS

Technical Application Field: Computational Material Science

	Module Name	ECTS	Prüfungsnummer	Semester
	Introduction to Advanced Maths and Calculus	1.5		WS
	Foundations of Finite Element Simulation	3		WS
	Materials and Structure	3	1708	WS
	Material Properties I	3	1710	WS
	Multi-scale Simulation Methods I	3		WS
	Multi-scale Simulation Methods II	3		SS
	Numerische Methoden in den Werkstoffwissenschaften – Atomistische Methoden	3		SS
	Generalized Continuum Models of Materials with Microstructures	1.5		SS
	Dislocation Theory and Dislocation Simulation	3		WS
	Computer Lab	6		WS

Technical Application Field: Computational Optics

	Module Name	ECTS	Prüfungsnummer	Semester
	Grundkurs Optik III		5	SS
	Grundkurs Optik IV / Basic Course in optics V: Nonlinear optics		5	WS
	Experimentalphysik 3: Optik und Quanteneffekte		7.5	WS
	Biologisches und Technisches Sehen		5	WS
	Photonik II		5	SS
	Optische Übertragungstechnik		5	WS