Selection table ***Materials Specialization I & II – WS 24/25*** Master Program Materials Science

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Basic rules:

Two to three topics must be chosen. Each must be studied with 6 to 24 CP. Total sum of 30 CP. Within a topic, rules apply as stated in the table:

				Turnus	**Next begin**
Topic: Advanced Materials Characterization					
	Solid State Spectroscopy (Dressel/Keimer)	9 CP	opt.	SS	2025
	Diffraction Methods in Materials Science	6 CP	opt.	will be announced	will be announced
	Physikalische Chemie III (Statistische Thermodynamik, Streu- und Diffraktionsmethoden mit Übung und Praktikum) (Gießelmann)	-	opt.	SS	2025
	High Resolution and Analytical Microscopy (Schmitz)	6 cp	opt.	SS	2025 is offered as a block course at the end of the lecture period
Topic: Functional Materials					
	Liquid Crystals (Gießelmann/Laschat)	6 CP	opt	WS every two years	2024
	Semiconductor Physics (Weis)	9 CP	opt.	WS over two Semesters	2024
	Advanced Experimental Physics (Wrachtrup)	9 CP	opt.	WS	2024
	Advanced Condensed Matter Physics (Wrachtrup)	6 CP	opt.	SS	2025
	Structure and Properties of Functional Polymers (Ludwigs)	6 CP	opt.	SS	2025
	Thin Film Materials and Coatings (Schmitz/Richter)	3 CP	opt.	WS	2024
	Materials for Energy Technologies (Clemens)	6 CP	opt.	SS	2025

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				Turnus	**Next begin**
	Polymer Electronics (Ludwigs)	3 CP	opt.	WS every two years	2025
	Bioinspired Approaches in Materials Science (Bill)	6 CP	opt.	SS every two years	2025
	Solid State and Electrochemistry – What to know before making a battery (Rasche)	3 CP	Opt.	WS	2024
Topic: Inorganic Materials Chemistry					
	Specialization: Inorganic materials chemistry for Material Scientists (Niewa)	12 CP	comp.	WS over two Semesters	2024
	Solid State and Materials Chemistry (Niewa)	6 CP	opt.	SS	2025
	Advanced Inorganic Synthesis Chemistry (Niewa)	6 CP	opt.	WS	2024
	Solid State and Electrochemistry – What to know before making a battery (Rasche)	3 CP	Opt.	WS	2024
Topic: Materials Theory and Simulation					
	Computational Chemistry (Kästner/Köhn)	6 CP	opt.	WS over two Semesters	2024
	Methoden der Werkstoffsimulation	6 CP	opt	WS	2024
	Simulation Methods in Physics for Chemists I	6 CP	Opt.	WS	2024
	Molecular Quantum Mechanics (Kästner/Köhn)	6 CP	opt	SS	2025
	Advanced Condensed Matter Physics (Wrachtrup/Bechinger)	6 CP	opt.	SS	2025

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				Turnus	**Next begin**
	Solid State Theory (Büchler)	9 CP	opt.	SS	2025
	Material design by ab-initio methods (Grabowski)	6 CP	opt.	WS	2024
	Computergestützte Materialwissenschaft	6 CP	opt.	WS	2024
Topic: Metals and Structural Materials					
6CP	Schadenskunde (Seidenfuß)	3 CP	comp	WS	2024
	Fügetechnik (Seidenfuß)	3 CP	comp	SS	2025
	Grundlagen der Keramik und Verbundwerkstoffe	6 CP	comp	WS&SS	2024/2025
	Intermetallics and Superalloys (Schmitz)	6 CP	comp	$SS_{\text{every two years}}$	2026
	Diffraction Methods in Materials Science	6 CP	opt.	-	-
	Werkstoffe und Fertigungstechnik technischer Kohlenstoffe (Kern)	3 CP	opt	$WS_{\text{over two Semesters}}$	2024
	Werkstoffeigenschaften (Klenk)	6 CP	opt.	SS	2025
	High Resolution and Analytical Microscopy (Schmitz)	6CP	opt.	SS	2024 is offered as a block course at the end of the lecture period
	Laboratory course electron microscopy (Schmitz)	3CP	opt.	SS	

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				Turnus	**Next begin**
Topic: Nanomaterials and Nanostructures					
	Fundamentals of Microelectronics (Burghartz)	6CP	opt.	-	-
	Advanced CMOS Devices and Technology (Burghart)	6CP	opt.	-	-
	Nanomaterials (Schmitz)	6 CP	opt.	WS every two years)	2025
	Thin film materials and coatings (Schmitz/Richter)	3 CP	opt.	WS	2024
	Emulsionen & Schäume	3CP	opt.	SS every two years	2025
	Membrane Biophysics	3 CP	Opt.	SS	2025
Topic: Polymer Science and Plastic Engineering (only in German)					
	Kunststofftechnik - Grundlagen und Einführung (Bonten)	6 CP	comp.	WS	2024
	Charakterisierung und Prüfung von Polymeren und Kunststoffen (Bonten)	3 CP	Comp.	WS	2024
	Faserkunststoffverbunde (Kreutzbruck)	3CP	Comp.	SS&WS	2024
	Praktikum Kunststofftechnik	3 CP	Comp.	WS	2024
	Kreislaufwirtschaft in der Kunststofftechnik – Aufbereitung, Recycling und Biokunststoffe	3 CP	opt.	WS	2024
	Grundlagen der zerstörungsfreien Prüfung	3 CP	Opt.	WS&SS	2024
	Structure and Properties of Functional Polymers (Ludwigs)	6CP	opt.	SS	2025

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				Turnus	**Next begin**
Topic: Soft Matter and Biomaterials					
	Liquid Crystals (Gießelmann/Laschat)	6 CP	opt.	WS every two years)	2024
	Polymer Electronics (Ludwigs)	3CP	opt.	WS every two years	2025
	Bioinspired Approaches in Material Science (Bill)	6 CP	opt.	SS every two years)	2025
	Emulsionen & Schäume	3CP	opt.	SS	2025
	Membrane Biophysics	3 CP	Opt.	SS	2025