

# Selection table *Materials Specialization I & II – WS 2019/2020*

Master Program

Materials Science

## Basic rules:

Two topics must be chosen. Each must be studied with 12 to 18 CP. Total sum on both 30 CP. Within a topic, rules apply as stated in the table:

				Turnus <sup>1</sup>	Next begin
<b>Topic: Advanced Materials Characterization</b>					
	Solid State Spectroscopy (Dressel/Keimer)	9 CP	opt.	SS	2020
	Diffraction Methods in Materials Science (Zotov)	6 CP	opt.	SS	preliminary 2020
	Physikalische Chemie III (Statistische Thermodynamik, Streu- und Diffraktionsmethoden mit Übung und Praktikum) (Gießelmann)	12 CP	opt.	SS	2020
	High Resolution and Analytical Microscopy (Stender/Schmitz)	6 cp	opt.	SS	2020
<b>Topic: Functional Materials</b>					
	Liquid Crystals (Gießelmann/Laschat)	6 CP	opt	WS every two years	2020
	Semiconductor Physics (Weis)	9 CP	opt.	WS over two Semesters	2019
	Advanced Experimental Physics (Wrachtrup/Bechinger)	9 CP	opt.	WS	2019
	Advanced Condensed Matter Physics (Wrachtrup)	6 CP	opt.	SS	2020
	Materials for Energy Technologies	6 CP	opt.	SS	2020
	Polymer Electronics (Ludwigs)	3 CP	opt.	WS	2019
	Bioinspired Approaches in Materials Science (Bill)	6 CP	opt.	SS every two years	2021
<b>Topic: Inorganic Materials Chemistry</b>					
	Inorganic Materials Chemistry for Material Scientists (Niewa)	12 CP	comp. <sup>2</sup>	WS	2019
	Solid State and Materials Chemistry (Niewa)	6 CP	opt.	SS	2020
	Advanced Inorganic Synthesis Chemistry (Niewa)	6 CP	opt.	WS	2019

<sup>1</sup> Bold: Recommended starting semester

<sup>2</sup> Compulsory, if respected topic is chosen

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<b>Topic: Materials Theory and Simulation</b>					
	Computational Chemistry (Kästner/Köhn)	6 CP	opt.	SS	2020
	Methoden der Werkstoffsimulation (Schmauder)	6 CP	opt	WS	2019
	Molecular Quantum Mechanics (Kästner/Köhn)	6 CP	opt	WS	2019
	Advanced Condensed Matter Physics (Bechinger)	6 CP	opt.	SS	2020
	Solid State Theory (Büchler)	9 CP	opt.	SS	2020
	Material design by ab-initio methods (Grabowski)	6 CP	opt.	WS	2019
	Computergestützte Materialwissenschaft (Schmauder)	6 CP	opt.	SS	2020
<b>Topic: Metals and Structural Materials</b>					
	Werkstoffe und Festigkeit (Seidenfuß/Klenk(Stumpfrock/Werz/Büttner) and/or	at least 6 CP	comp. <sup>3</sup>	WS&SS	2019
	Grundlagen der Keramik und Verbundwerkstoffe (Gadow) and/or			WS&SS	2019
	Alloy Design, Intermetallics and Superalloys (Stender/Schmitz)			SS (every two years)	2020
	Diffraction Methods in Materials Science (Zotov)	6 CP	opt.	SS	Preliminary 2020
	Werkstoffe und Fertigungstechnik technischer Kohlenstoffe (Kern)	3 CP	opt	WS&SS	2019
	Werkstoffeigenschaften (Klenk)	6 CP	opt.	WS&SS	2019
<b>Topic: Nanomaterials and Nanostructures</b>					
	Fundamentals of Microelectronics (Burghartz)	6CP	opt.	SS	2020
	Surfaces & Colloids (Stubenrauch/Fischer/Sottmann)	6 CP	opt.	WS every two years)	2020
	Nanomaterials (Schmitz)	6 CP	opt.	WS every two years)	2020
	The Physics of Material Surfaces (Schmitz/von Wrochem)	3 CP	opt.	WS	2019
	Thin film materials and coatings (Schmitz/Richter)	3 CP	opt.	WS	2019

<sup>3</sup> Compulsory, if respected topic is chosen

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<b>Topic: Plastics Engineering</b>						
	Kunststofftechnik - Grundlagen und Einführung (Bonten)	6 CP	comp.	WS		2019
	Charakterisierung und Prüfung von Polymeren und Kunststoffen (Bonten)	3 CP	Comp.	WS		2019
	Faserkunststoffverbunde (Kreutzbruck)	3CP	Comp.	SS&WS		2019
	Kunststoffaufbereitung und Kunststoffrecycling (Kroh/Bonten)	3 CP	opt.	WS		2019
	Kunststoff-Werkstofftechnik 1 (Bonten)	3 CP	opt.	WS		2019
	Grundlagen der zerstörungsfreien Prüfung (Kreutzbruck)	3CP	Opt.	SS&WS		2019
<b>Topic: Soft Matter and Biomaterials</b>						
	Liquid Crystals (Gießelmann/Laschat)	6 CP	opt.	WS every two years)		2020
	Surfaces and Colloids (Sottmann/Stubenrauch)	6 CP	opt.	WS every two years)		2019
	Bioinspired Approaches in Material Science (Bill)	6 CP	opt.	SS every two years)		2021