



## Masterstudium **ADVANCED MATERIALS SCIENCE**

**SPO** ab 01.10.2018 (Änderung) – Plan nach ECTS  
 studierbar bis 30.09.2025

Matrikel-Nr.

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 Familienname, Vorname(n)

Kennzeichnung des Studiums

<b>UB</b>	0	6	6	5	1	1
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Auflagen:  JA,  NEIN → Auflagen überprüft

**VORSTUDIUM:** Chemie , Physik , USW-NaWi/Tech. , Wirtschaftsingenieurw.-Maschinenbau ,  
 Maschinenbau , Verfahrenstechnik , Elektrotechnik der TU-Graz ,  
 Anderes  \_\_\_\_\_

Lehrveranstaltung	Typ	SWS	Datum	Note	ECTS	
<b>Modul 1</b> (je nach Vorstudium ist ein Modul zu wählen)						<b>(11 – 17)</b>
<b>Modul 1A: Introduction module for students with Bachelor programme CHEMISTRY</b>					<b>13</b>	
Basic Laboratory for Advanced Materials Science	LU	2,67			02	
Introduction to Solid State Physics	VO	02			03	
Introduction to Materials Science	VO	02			03	
Introduction to Modelling and Simulation	VU	02			03	
Mathematics for Advanced Materials	VU	02			02	
<b>Modul 1B: Introduction module for students with Bachelor programme PHYSICS</b>					<b>12</b>	
Basic Laboratory for Advanced Materials Science	LU	2,67			02	
Introduction to Materials Science	VO	02			03	
Applied Chemistry I	VO	1,33			02	
Applied Chemistry II	VO	1,33			02	
Analytical Chemistry	VO	02			03	

Lehrveranstaltung	Typ	SWS	Datum	Note	ECTS	
<b>Modul 1C: Introduction module for students with Bachelor programme MECHANICAL ENGINEERING</b>					<b>14</b>	
Basic Laboratory for Advanced Materials Science	LU	2,67			02	
Introduction to Solid State Physics	VO	02			03	
Atom Physics – Quantum Mechanics	VO	1,33			02	
Applied Chemistry I	VO	1,33			02	
Applied Chemistry II	VO	1,33			02	
Analytical Chemistry	VO	02			03	
<b>Modul 1D: Introduction module for students with Bachelor programme CHEMICAL ENGINEERING</b>					<b>12</b>	
Basic Laboratory for Advanced Materials Science	LU	2,67			02	
Introduction to Solid State Physics	VO	02			03	
Introduction to Materials Science	VO	02			03	
Atom Physics – Quantum Mechanics	VO	1,33			02	
Applied Chemistry II	VO	1,33			02	
<b>Modul 1E: Introduction module for students with Bachelor programme ENVIRONMENTAL SYSTEM SCIENCE – NATURAL SCIENCE AND TECHNOLOGY</b>					<b>11</b>	
Basic Laboratory for Advanced Materials Science	LU	2,67			02	
Introduction to Solid State Physics	VO	02			03	
Introduction to Materials Science	VO	02			03	
Introduction to Modelling and Simulation	VU	02			03	
<b>Modul 1: Introduction module for students with Bachelor programme Elektrotechnik</b> Vorstudium Bachelorstudium <b>Elektrotechnik</b> der <u>Technische Universität Graz</u> <b>AUFLAGEN:</b> (Der Umfang des Wahlfaches General Electives and Soft Skills reduziert sich dadurch auf 6 ECTS.)					<b>17</b>	
Basic Laboratory for Advanced Materials Science	LU	2,67			02	
Introduction to Solid State Physics	VO	02			03	
Introduction to Materials Science	VO	02			03	

Lehrveranstaltung	Typ	SWS	Datum	Note	ECTS	
Atom Physics – Quantum Mechanics	VO	1,33			02	
Applied Chemistry I	VO	1,33			02	
Applied Chemistry II	VO	1,33			02	
Analytical Chemistry	VO	02			03	
<b>Modul 2: Fundamentals of Material Science</b>					<b>10</b>	<b>(15)</b>
Introduction to Solid State Chemistry for Advanced Materials Science	VO	1,33			02	
Materials Production and Processing	VO	02			03	
Modelling and Simulation for Advanced Materials Science	VU	02			02	
Physical Properties of Materials	VO	02			03	
Wenn Vorstudium Elektrotechnik: Thermodynamik für USW	VO	02			03	Modul 2 erhöht sich auf 15 ECTS
Wenn Vorstudium Elektrotechnik: Thermodynamik für USW	UE	01			02	+ FWF verringert sich auf 7 ECTS
<b>Modul 3: Materials Characterization and Materials Laboratory</b>					<b>10</b>	
Materials Laboratory	LU	04			04	
Materials Characterization I	VO	1,33			02	
Materials Characterization II	VO	1,33			02	
Materials Characterization III	VO	1,33			02	
<b>Specialization: Modul _____</b> (A+B+C des <b>selben</b> Vertiefungsmoduls sind zu wählen)					<b>33</b>	<b>(15 + 6 + 12)</b>
<b>Specialization: METALS AND CERAMICS</b>					<b>15</b>	
<b>Modul 4A: Theory and Application</b>						
Plasticity and Forming Processes	VO	2,66			04	
Corrosion and Corrosion Protection of Metallic Materials	VO	02			03	
Functional Materials I	VO	02			03	
Functional Materials II	VO	0,66			01	
High-performance Materials and Composites	VO	2,66			04	
<b>Specialization: METALS AND CERAMICS</b>					<b>06</b>	
<b>Modul 4B: Laboratory</b>						
Laboratory Course Metals and Ceramics	LU	06			06	

Lehrveranstaltung	Typ	SWS	Datum	Note	ECTS	
<b>METALS AND CERAMICS Modul 4C: Elective Subject</b>					<b>12</b>	
Project Laboratory	PT	08			06	
Structural Transformation and Diffusion in Materials	VU	03			03	
Joining Technology	VO	02			03	
Werkstoffkunde Stahl für Advanced Materials Science	VO	1,33			02	
Failure Analysis	VU	02			02	
Structurally Complex Materials	VO	02			03	
Electrical Engineering Materials	VO	02			03	
Electro-chemical Surface Refinement	VO	02			03	
Advanced 2D and 3D Nanoanalysis	VU	02			03	
Fracture Mechanics for Advanced Materials Science	VO	1,33			02	
Surface Science	VO	02			03	
Laboratory Exercises in Computer Supported Measurement Techniques for Advanced Materials Science	LU	02			03	
Materials Selection	VU	02			03	
Materials and the Environment	VU	02			02	
Introduction to Solid State Physics, Exercise	UE	01			01	
Topics in Metals and Ceramics	VO	02			03	
<b>Specialization: SEMICONDUCTOR PROCESSING AND NANOTECHNOLOGY Modul 5A: Theory and Application</b>					<b>15</b>	
Microelectronics and Micromechanics	VO	02			03	
Organic Semiconductors	VO	02			03	
Modelling and Simulation of Semiconductors	VU	02			03	
Surface Science	VO	02			03	
Nanostructures and Nanotechnology	VO	02			03	
<b>Specialization: SEMICONDUCTOR PROCESSING AND NANOTECHNOLOGY Modul 5B: Laboratory</b>					<b>06</b>	
Laboratory Course Semiconductor Processing and Nanotechnology	LU	06			06	

Lehrveranstaltung	Typ	SWS	Datum	Note	ECTS	
<b>SEMICONDUCTOR PROCESSING AND NANOTECHNOLOGY</b>					<b>12</b>	
<b>Modul 5C: Elective Subject</b>						
Project Laboratory	PT	08			06	
Electron Transport in Mesoscopic Systems	VO	02			03	
Structuring of Material Surface and Functional Nanofabrication	VU	02			02	
Physics of Semiconductor Devices	VO	02			03	
Solid State Spectroscopy	VO	02			03	
Thin Film Science and Processing	VO	02			03	
Surface Chemistry	VO	02			03	
IC Design Project Management and Quality	VO	01			1,5	
High Resolution Electron Microscopy	VO	02			03	
Vacuum Technology	VO	02			03	
Introduction to Solid State Physics, Exercise	UE	01			01	
Nano-Optics	VO	02			03	
Scanning Probe Techniques	VO	02			03	
Synchrotron Radiation Techniques	VO	02			03	
Nano- and Quantum Magnetism	VO	02			03	
Spectroscopy	VO	02			03	
Light Engineering	VO	02			03	
X-ray and Neutron Scattering	VO	02			03	
Topics in Semiconductor Processing and Nanotechnology	VO	02			03	
<b>Specialization: BIOBASED MATERIALS</b>					<b>15</b>	
<b>Modul 6A: Theory and Application</b>						
Introduction to Biophysics and Biochemistry	VO	02			03	
Biocompatible Materials	VO	02			03	
Soft Matter Physics	VO	02			03	
Physical and Chemical Characterization of Biopolymers	VO	02			03	
Biological and Biobased Materials	VO	02			03	

Lehrveranstaltung	Typ	SWS	Datum	Note	ECTS	
<b>Specialization: BIOBASED MATERIALS Modul 6B: Laboratory</b>					<b>06</b>	
Laboratory Course Biobased Materials	LU	06			06	
<b>BIOBASED MATERIALS Modul 6C: Elective Subject</b>					<b>12</b>	
Project Laboratory	PT	08			06	
Intermolecular Forces in Hybrid Materials	VO	1,33			02	
Renewable Resources – Chemistry and Technology I	VO	1,33			02	
Environmental Chemistry and Technology	VO	2,66			04	
Biophysical Methods	VO	02			03	
Biophysical Methods	LU	03			03	
Advanced Biophysics and Biochemistry	VO	02			03	
Structure and Matter – Scattering Methods	VO	02			03	
Tissue Engineering	VO	02			03	
Biophotonics	VO	02			03	
Computational Biomechanics	VU	04			5,5	
Physical Chemistry I: Structure and Matter	VO	03			04	
Elemental Mass Spectrometry	VO	1,33			02	
Introduction into Simulation of Polymeric Materials	VO	0,66			01	
Soft Matter Microscopy	VO	02			03	
Milli and Micro Fluid Mechanics	VU	02			02	
Topics in Biobased Materials	VO	02			03	
<b>Modul Master Seminar</b>					<b>01</b>	
Master seminar	SE	01			01	

Lehrveranstaltung	Typ	SWS	Datum	Note	ECTS	
<b>General Electives and Soft Skills</b> (Introduction Modul "Modul 1" + General Electives and Soft Skills = <b>23 ECTS!</b> )					<b>09-12</b>	ergänzend zu Modul 1
<p>LVen der nicht gewählten Elective Subjects + LVen der nicht gewählten Specialization + <b>3 - 4 ECTS müssen an Soft Skills gewählt werden</b> (Liste liegt beim Cuko-Vorsitz auf); <b>max. 1 „Project Laboratory“</b> darf im gesamten Masterstudium verwendet werden.                      [Sollten Sie in der Specialization 1 ECTS zu viel oder zu wenig haben, so kann die entsprechende LV durch Anerkennung auf die Specialization und General Electives and Soft Skills aufgeteilt werden.]</p>						
<b>Free-choice subject</b> (Freifach/Freies Wahlfach) (wenn Vorstudium Elektrotechnik: Modul 2 = 15 ECTS + FWF = 7 ECTS)!				<b>E</b>	<b>12</b>	N <sub>FWF</sub> : 1:1 VO = 1:1,5
<b>Master thesis</b>					<b>30</b>	
<b>Master examination</b>					<b>01</b>	

Das viersemestrige Masterstudium umfasst einen Arbeitsaufwand von 120 ECTS-Anrechnungspunkten.

**Das Thema der Masterarbeit** muss der gewählten Specialization (Vertiefungsrichtung) zuordenbar sein.

**Voraussetzungen für die Anmeldung zur Masterprüfung sind:**

- Nachweis der positiven Beurteilung aller Lehrveranstaltungen inkl. der Freien Wahlfächer
- die positive Beurteilung der Masterarbeit

**Masterprüfung:** eine Gesamtnote

- Präsentation der Masterarbeit (max. 20 Min.)
- Verteidigung der Masterarbeit (Prüfungsgespräch)
- einer Prüfung über die gewählte fachspezifische Specialization (Vertiefungsrichtung)