



Masterstudium **ADVANCED MATERIALS SCIENCE**

SPO ab 01.10.2018 (Änderung) – Plan nach ECTS
laut Mitteilungsblatt vom 14.03.2018 ([Stück 23.b](#))

Matrikel-Nr.

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Familienname, Vorname(n)

Kennzeichnung des Studiums

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| 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 | |
|---|-----|------|-------|------|-----------|------------------|
| Modul 1 (je nach Vorstudium ist ein Modul zu wählen) | | | | | | (11 – 17) |
| Modul 1A: Introduction module for students with Bachelor programme CHEMISTRY | | | | | 13 | |
| 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 | |
| Modul 1B: Introduction module for students with Bachelor programme PHYSICS | | | | | 12 | |
| 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 | |
|---|-----|------|-------|------|-----------|--|
| Modul 1C: Introduction module for students with Bachelor programme MECHANICAL ENGINEERING | | | | | 14 | |
| 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 | |
| Modul 1D: Introduction module for students with Bachelor programme CHEMICAL ENGINEERING | | | | | 12 | |
| 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 | |
| Modul 1E: Introduction module for students with Bachelor programme ENVIRONMENTAL SYSTEM SCIENCE – NATURAL SCIENCE AND TECHNOLOGY | | | | | 11 | |
| 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 | |
| Modul 1: Introduction module for students with Bachelor programme Elektrotechnik Vorstudium Bachelorstudium Elektrotechnik der <u>Technische Universität Graz</u> AUFLAGEN: (Der Umfang des Wahlfaches General Electives and Soft Skills reduziert sich dadurch auf 6 ECTS.) | | | | | 17 | |
| 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 | |
| Modul 2: Fundamentals of Material Science | | | | | 10 | (15) |
| 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 + FWF verringert sich auf 7 ECTS |
| Wenn Vorstudium Elektrotechnik: Thermodynamik für USW | UE | 01 | | | 02 | |
| Modul 3: Materials Characterization and Materials Laboratory | | | | | 10 | |
| 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 | |
| Specialization: Modul _____ (A+B+C des selben Vertiefungsmoduls sind zu wählen) | | | | | 33 | (15 + 6 + 12) |
| Specialization: METALS AND CERAMICS | | | | | | |
| Modul 4A: Theory and Application | | | | | 15 | |
| 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 | |
| Specialization: METALS AND CERAMICS | | | | | | |
| Modul 4B: Laboratory | | | | | 06 | |
| Laboratory Course Metals and Ceramics | LU | 06 | | | 06 | |

| Lehrveranstaltung | Typ | SWS | Datum | Note | ECTS | |
|---|-----|------|-------|------|-----------|--|
| METALS AND CERAMICS Modul 4C: Elective Subject | | | | | 12 | |
| 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 | |
| Specialization: SEMICONDUCTOR PROCESSING AND NANOTECHNOLOGY Modul 5A: Theory and Application | | | | | 15 | |
| 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 | |
| Specialization: SEMICONDUCTOR PROCESSING AND NANOTECHNOLOGY Modul 5B: Laboratory | | | | | 06 | |
| Laboratory Course Semiconductor Processing and Nanotechnology | LU | 06 | | | 06 | |

| Lehrveranstaltung | Typ | SWS | Datum | Note | ECTS | |
|--|-----|-----|-------|------|-----------|--|
| SEMICONDUCTOR PROCESSING AND NANOTECHNOLOGY | | | | | 12 | |
| Modul 5C: Elective Subject | | | | | | |
| 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 | |
| Specialization: BIOBASED MATERIALS | | | | | 15 | |
| Modul 6A: Theory and Application | | | | | | |
| 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 | |
|--|-----|------|-------|------|-----------|--|
| Specialization: BIOBASED MATERIALS Modul 6B: Laboratory | | | | | 06 | |
| Laboratory Course Biobased Materials | LU | 06 | | | 06 | |
| BIOBASED MATERIALS Modul 6C: Elective Subject | | | | | 12 | |
| 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 | |
| Modul Master Seminar | | | | | 01 | |
| Master seminar | SE | 01 | | | 01 | |

| Lehrveranstaltung | Typ | SWS | Datum | Note | ECTS | |
|---|-----|-----|-------|----------|--------------|--------------------------------------|
| General Electives and Soft Skills (Introduction Modul "Modul 1" + General Electives and Soft Skills = 23 ECTS!) | | | | | 09-12 | ergänzend zu Modul 1 |
| <p>LVen der nicht gewählten Elective Subjects + LVen der nicht gewählten Specialization + 3 - 4 ECTS müssen an Soft Skills gewählt werden (Liste liegt beim Cuko-Vorsitz auf); <u>max. 1 „Project Laboratory“</u> 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> | | | | | | |
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| Free-choice subject (Freifach/Freies Wahlfach) (wenn Vorstudium Elektrotechnik: Modul 2 = 15 ECTS + FWF = 7 ECTS!) | | | | E | 12 | N _{FWF} : 1:1 VO = 1:1,5 |
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| Master thesis | | | | | 30 | |
| Master examination | | | | | 01 | |

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)