In brief
Degree: Master of Science (M.Sc.) Materials Chemistry and Mineralogy
Duration: 2 years
Admission requirement:
B.Sc. in chemistry, materials science or mineralogy
English proficiency B2.2
Teaching language: English
Application deadline: Feb. 28
Program start: October

Program
Materials Chemistry and Mineralogy is an international postgraduate study program covering application and research related topics ranging from raw materials to industrial products. The curriculum is divided into a general mandatory part and an elective part focusing on either chemistry or mineralogy. The mandatory part (42 CP) includes lectures and exercises in the fields of mineralogy, crystallography, chemistry (solid state and surfaces) and materials science, and a broad education in analytical methods. In the elective part (48 CP) special topics and skills in the field of materials chemistry or mineralogy are covered.

The interdisciplinary study program is offered in cooperation of the Depts. of Geosciences and Chemistry with strong contributions from the Engineering Department and the University of Applied Sciences.

Prospects
- Materials-oriented industries such as glass, ceramics, refractories, paper, dye, pharmaceuticals, gemstones and building materials
- Materials-dependent fields such as biomineralization, dentistry, electronics, energy supply and storage, and crystal growth
- Recycling, waste management and remediation industries
- Materials research at universities and other research institutes
- Knowledge-based work in quality management, patent systems, environmental authorities, education and consulting

Materials Chemistry and Mineralogy at Bremen University
Located in one of the largest geoscience departments in Germany hosting the renowned MARUM marine research center, the master's program is organized by both Chemistry and Geosciences departments, thus profiting from their combined strengths. Strong support from the Department of Engineering and the University of Applied Sciences makes it truly interdisciplinary and unique.

Geosciences and Materials Sciences are two out of six high-profile areas at the University of Bremen, a mid-sized university (~18,000 students) renowned for excellent research and teaching.

Students in Materials Chemistry and Mineralogy profit from the up-to-date scientific instrumentation. Special emphases lie on materials, e.g., ceramics, oxidic nanoparticles, building materials, inorganic surfaces, porous materials, and methods for materials’ analysis, including diffraction, spectroscopy, scanning and transmission electron microscopy, etc.
Materials Chemistry and Mineralogy
International Master’s Program at the University of Bremen

Program structure

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<th>Mineralogy</th>
<th>Crystallography</th>
<th>Chemistry</th>
<th>Materials Science</th>
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<tr>
<td>Analytical Methods II</td>
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<td>Profile block: 2-4 modules from chemistry and 1-2 modules from mineralogy or vice versa</td>
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<tr>
<td>General Studies</td>
<td>Research Module I</td>
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During the first semester fundamentals of all core subjects are presented in lectures and accompanying exercises, including mineralogy, crystallography, chemistry and materials science. Furthermore, a two-semester training in a number of analytical methods starts and is continued in the second semester. Here, the two-semester profile section starts which comprises 48 CP. Within a profile 30-42 CP are to be accumulated while 6-18 CP are to be selected from the second profile (for details see syllabus). The General Studies module is dedicated to an elective course from the university’s program and a programming course. Once the profile has been fixed, this is also a commitment for the choice of the research module. It is dedicated to the development and presentation of research projects and prepares the students for their master thesis. The fourth semester is reserved for thesis work, which has to be defended in a colloquium.

Teaching units are predominantly scheduled as weekly assignments throughout an academic semester (Oct.-Feb., Apr-Jul). Short field excursions (depending on the selected elective modules), lab work, or special projects may be scheduled as blocks assigned to a few weeks within a semester break.

Specialization Offer

Modules

PROFILE CHEMISTRY
- Solid State Synthesis an Identification
- Structure Property Relationship
- Surface Chemistry and Catalysis
- Computational Materials Science
- Solid State Spectroscopy
- Multiple (Large) Dataset Analysis

Research Module Chemistry I
Research Module Chemistry II

PROFILE MINERALOGY
- Crystal Structure Analysis
- Physical Properties of Crystals
- Minerals and Materials
- Petrological Methods in Ore Geology
- Functional Ceramics
- Technical Ceramics
- Nanomaterials
- Special Topics in Mineralogy and Material Science

Research Module Mineralogy I
Research Module Mineralogy II

Compulsory Part

Modules
- Analytical Methods I
- Analytical Methods II
- Mineralogy
- Crystallography
- Chemistry
- Materials Science
- General Studies
- Master Thesis

Application

Until Feb. 28 online via https://moin-uni-bremen.de

Application documents: Bachelor certificate, transcript of records, CV, English proficiency proof, working experience certificates. Qualified applicants will be assessed by an aptitude test. Admission results are not published before May.

Requirements

- B.Sc. in chemistry, materials science, or in a geoscientific field with a specialization in crystallography or mineralogy
- at least 10 ECTS CP in maths, chemistry and physics
- at least 24 ECTS CP in mineralogy, crystallography, materials science or chemistry
- English proficiency B2.2
- Ability to work both independently and as part of a team
- Intercultural competence

Information

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