

# Materials Chemistry and Mineralogy

International Master's Program at the University of Bremen

**Solid State Synthesis & Characterization**  
**Surface Reactions**  
**Technical Chemistry**

**Crystal Structure**  
**Ceramics**  
**Minerals and Materials**

## 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.

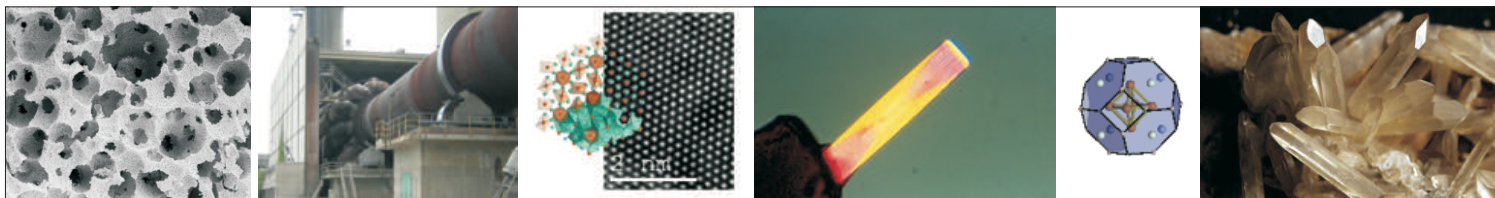
The curriculum is divided into a general mandatory part and an elective part focusing on either chemistry or mineralogy. The mandatory part (42 CP) includes lectures and exercises in the fields of mineralogy, crystallography, chemistry (solid state and surfaces) and materials science, and a broad education 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.



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## Program structure

Analytical Methods I	Mineralogy	Crystallography	Chemistry	Materials Science	1 <sup>st</sup> year
Analytical Methods II	Profile block: 2-4 modules from chemistry and 1-2 modules from mineralogy or vice versa				
General Studies	Research Module I Chemistry/Mineralogy		Research Module II Chemistry/Mineralogy		2 <sup>nd</sup> year
Master Thesis					

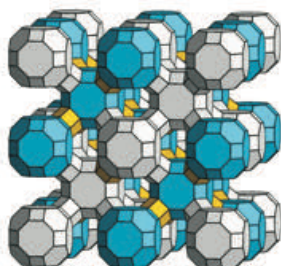
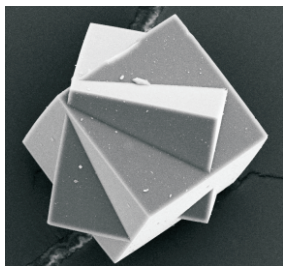
During the first semester fundamentals of all core subjects are presented in lectures and accompanying exercises, including mineralogy, crystallography, chemistry and materials science.

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 and 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

Dr. Ulrike Wolf-Brozio  
Postgraduate Coordinator  
Department of Geosciences  
P.O. Box 330 440  
D-28334 Bremen / Germany  
[msc.mineral@uni-bremen.de](mailto:msc.mineral@uni-bremen.de)  
[www.geo.uni-bremen.de](http://www.geo.uni-bremen.de)