

## Chemical Principles and Sustainable Technologies along the Raw Materials Value Chain (1003018)

**Course size** *(nominal values; actual values may depend on programme)*

**Credits** 13.0

**Study time** 390 h

**Course offerings in academic year 2024-2025**

A (Year)

English

Gent

**Lecturers in academic year 2024-2025**

Frisch, Gero

FREIBE01

lecturer-in-charge

**Offered in the following programmes in 2024-2025**

[International Master of Science in Sustainable and Innovative Natural Resource Management](#)

**crdts**

13

**offering**

A

**Teaching languages**

English

**Keywords**

**Position of the course**

**Contents**

Theoretical and practical aspects of

- raw materials analysis and process analysis techniques,
- raw materials processing and recycling technologies, including mechanical, hydro-, pyro- and electrometallurgical methods,
- chemistry of minerals and ore deposits, modelling of chemical equilibria and kinetics
- process chain design, circular economy and process economics in the raw materials sector

**Initial competences**

**Final competences**

- 1 Upon completion of this module, students should be able to
  - apply fundamental chemical concepts to modern raw materials analysis, extraction, purification, and production techniques,
- 2 • analyse how different disciplines and technologies must interact to design a process in the raw materials sector,
- 3 • be able to propose an appropriate technology to process a given resource,
- 4 • discuss and design innovative solutions to current industry challenges, including aspects of circular economy and entrepreneurship.

**Conditions for credit contract**

This course unit cannot be taken via a credit contract

**Conditions for exam contract**

This course unit cannot be taken via an exam contract

**Teaching methods**

Group work, Seminar, Excursion, Lecture, Practical, Independent work

**Study material**

None

## References

J.S. Gaffney et al., General Chemistry for Engineers, Elsevier 2018  
D. Möller, Chemistry for Environmental Scientists, De Gruyter 2015  
M. Bertau et al., Industrial Chemistry, Wiley, 2016  
Kirk-Othmer et al., Chemical Technology, Wiley, 2013

## Course content-related study coaching

### Assessment moments

end-of-term and continuous assessment

### Examination methods in case of periodic assessment during the first examination period

Written assessment

### Examination methods in case of periodic assessment during the second examination period

Written assessment

### Examination methods in case of permanent assessment

Participation, Written assessment

### Possibilities of retake in case of permanent assessment

not applicable

### Calculation of the examination mark

For the award of credit points it is necessary to pass the module exam.

The module exam contains:

KA\*: written exam [180 min]

AP\*: case studies

AP\*: practicals

PVL\*: fundamental chemistry workshops

PVL have to be satisfied before the examination.

\* In modules requiring more than one exam, this exam has to be passed or completed with at least "ausreichend" (4,0), respectively.