Course Specifications
Valid in the academic year 2019-2020

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size
(nominal values; actual values may depend on programme)
Credits 5.0  Study time 150 h  Contact hrs 45.0 h

Course offerings and teaching methods in academic year 2019-2020
A (semester 1)  English  UGent  on campus lecture 25.0 h
on campus seminar 20.0 h

Lecturers in academic year 2019-2020
Bertrand, Sebastien  WE13  lecturer-in-charge
Dewaele, Stijn  WE13  co-lecturer

Offered in the following programmes in 2019-2020  crdts  offering
Bachelor of Science in Geology  5  A

Teaching languages
English

Keywords
Geochemistry, Chemistry of the natural environment

Position of the course
The role of chemical processes in the evolution of the Earth is elucidated. It is indicated to which extent chemical data and concepts contribute to a better understanding of geological processes.

Contents
• Calculation of chemical equilibrium at geologically relevant conditions of temperature and pressure.
• Oxidation-reduction reactions
• Chemical speciation : pH-Eh and pH-fO2 predominance diagrams.
• Trace element fractionation during magmatic differentiation: partition coefficients and model calculations.
• Meteorites as reference frame for a study of the chemical differentiation of the Earth and Moon.
• Formation of the elements and isotopes, and their distribution among geochemical reservoirs
• Influence of solubility and weathering of minerals on the chemical composition of natural waters.
• The chemical composition of seawater.
• Introduction to organic geochemistry, including biomarkers.
• Basic concepts of the geochemical cycles of C and N.
• Analytical techniques in geochemistry.

Initial competences
Basic knowledge of: general chemistry and physics, analytical chemistry, structure and composition of the Earth, endogenetic and exogenetic geological processes.
The student should have successfully followed a course on General Chemistry, and a General Geology course.

Final competences
1 The student shows insight in the Earth's chemistry.
2 He/she can apply theoretical geochemical concepts to practical problems.
3 He/she can establish links between Geochemistry and other branches of Earth Sciences such as Petrology, Mineralogy, Isotope Geology, Geodynamics and Sedimentology.
Conditions for credit contract
   Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract
   This course unit cannot be taken via an exam contract

Teaching methods
   On campus lecture, on campus seminar

Learning materials and price
   Lecture notes available free of charge on Ufora.

References

Course content-related study coaching
   Practical exercises: development of skills to solve problems; intensive support during practical sessions.
   Individual guidance by lecturer or co-workers (by appointment).

Evaluation methods
   end-of-term evaluation and continuous assessment

Examination methods in case of periodic evaluation during the first examination period
   Written examination with open questions, assignment

Examination methods in case of periodic evaluation during the second examination period
   Written examination with open questions, assignment

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation
   not applicable

Calculation of the examination mark
   Theoretical exam at the end of the semester (70%)
   Exercises at the end of the semester (15%)
   Article presentation and discussion (15%)

(Approved)