

## Inorganic Chemistry 2: Reactivity of Matter (O000087)

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

Credits 5.0 Study time 150 h Contact hrs 60.0 h

Course offerings and teaching methods in academic year 2019-2020

A (semester 2)	English	guided self-study	6.0 h
		lecture	24.0 h
		practicum	30.0 h

Lecturers in academic year 2019-2020

Cirkovic Velickovic, Tanja	KR01	lecturer-in-charge
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Offered in the following programmes in 2019-2020

	crdts	offering
<a href="#">Bachelor of Science in Environmental Technology</a>	5	A
<a href="#">Bachelor of Science in Food Technology</a>	5	A
<a href="#">Bachelor of Science in Molecular Biotechnology</a>	5	A
<a href="#">Joint Section Bachelor of Science in Environmental Technology, Food Technology and Molecular Biotechnology</a>	5	A

Teaching languages

English

Keywords

Reaction speed, Chemical equilibrium, Chemical thermodynamics, Acids, Bases, Salts, Buffer, Electrochemistry

Position of the course

This is a bachelor course in which students will be introduced to the basic principles of reactivity of matter in inorganic chemistry. The emphasis of the course is made on the thermodynamic driving forces for chemical changes, and the course is well suited to attribute to the development of scientific skills such as analytical reasoning, ability to critical reflection and problem solving capability in inorganic chemistry.

Contents

1. Chemical kinetics: reaction order, reaction mechanism, catalysts
  2. Chemical equilibrium: equilibrium condition, Le Châtelier's principle
  3. Chemical thermodynamics: internal energy, enthalpy, entropy, Gibb's free energy, spontaneous processes, useful work of a chemical process
  4. Applications of chemical equilibria in aqueous solutions: acids, bases, salts, pH, buffers, redox reactions, batteries, electrolysis
  5. An introduction to organic chemistry, polymer chemistry and coordination compounds chemistry.
- Practical sessions: Rate of chemical reactions, Le Châtelier's principle, acid-base equilibria, buffers, solubility equilibria.

Initial competences

Basic knowledge of general chemistry

Final competences

- 1 The student will acquire a fundamental knowledge of definitions, units and terminology to describe chemical processes.
- 2 As a future Bachelor in Food Technology, Environmental Technology or Molecular Biotechnology the student will have the necessary insight in the fundamental concepts governing the reactivity of matter.
- 3 The student will be able to estimate chemical behaviour of a variety of products in aqueous medium.

- 4 The student will be able to analyze problems in general and inorganic chemistry and propose appropriate strategies for their solution.

#### Conditions for credit contract

Access to this course unit via a credit contract is unrestricted: the student takes into consideration the conditions mentioned in 'Starting Competences'

#### Conditions for exam contract

This course unit cannot be taken via an exam contract

#### Teaching methods

Guided self-study, lecture, practicum

#### Learning materials and price

Chang/Goldsby. General Chemistry. The Essential Concepts. Seventh Edition.

#### References

#### Course content-related study coaching

*Interactive counselling through Minerva. Individual electronic appointment booking.*

#### 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, written examination with multiple choice questions

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

Written examination with open questions, written examination with multiple choice questions

#### Examination methods in case of permanent evaluation

Written examination with open questions, participation, report

#### Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible in modified form

#### Extra information on the examination methods

*Following practical session a written report will be submitted for evaluation and it will contribute to the final mark with 10%. Periodic evaluation (twice during the semester) in a form of a written performance assessment test with open questions will contribute to the mark with 10%. Absence from practical session will result in a maximum mark 9/20.*

#### Calculation of the examination mark

Written examination with open questions 60%

Written examination with multiple choice questions 20%

Performance assessment 10%

Report 10%