

Chemical Analytical Methods (O000136)

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

Credits 4.0 Study time 120 h Contact hrs 60.0 h

Course offerings and teaching methods in academic year 2019-2020

A (semester 1)	English	practicum	24.0 h
		lecture	24.0 h
		guided self-study	12.0 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
Bachelor of Science in Environmental Technology	4	A
Bachelor of Science in Food Technology	4	A
Bachelor of Science in Molecular Biotechnology	4	A
Joint Section Bachelor of Science in Environmental Technology, Food Technology and Molecular Biotechnology	4	A

Teaching languages

English

Keywords

Analytical chemistry, Sampling, Gravimetry, Volumetry, Electrochemical methods, Spectroscopy, Separation techniques, Chromatography

Position of the course

This course teaches the principles and applications of analytical methods and techniques in the field of bioscience engineering. The transfer of knowledge and the efficient use of these techniques in order to be able to solve analytical problems are the main objectives of the course.

Contents

1. Introduction
2. Basic tools
3. Evaluating analytical data
4. Standardizing analytical methods
5. Equilibrium chemistry
6. Collecting and preparing samples
7. Gravimetric methods
8. Titrimetric methods
9. Spectroscopic methods
10. Electrochemical Methods
11. Chromatography

Practical sessions: volumetric and gravimetric analysis; potentiometric titration; chromatography.

Initial competences

Basic knowledge of general and inorganic chemistry.

Final competences

- 1 The student will acquire a fundamental knowledge of definitions, units and terminology to describe quantitative and qualitative chemical analytical data, to have knowledge of the fundamental principles, underlying mechanisms and application potentials of common analytical techniques, to be capable of making an argued choice between possible approaches for addressing an analytical problem and to be

able to interpret and report analytical results in an objective way and to evaluate their accuracy and reliability.

- 2 Knowledge of the fundamental principles, underlying mechanisms and application potentials of common analytical techniques
- 3 Student is able to interpret and report analytical results in an objective way

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

Extra information on the teaching methods

Lecture, 24 hours

Practicum, 24 hours

Guided self-study - problem solving sessions, 12 hours

Learning materials and price

Analytical Chemistry 2.0, David Harvey

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 multiple choice 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%