

## Chemical Analytical Methods (0000136)

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.

|                    |  |                    |        |
|--------------------|--|--------------------|--------|
| <b>Course size</b> | <i>(nominal values; actual values may depend on programme)</i> |                    |        |
| <b>Credits</b> 4.0 | <b>Study time</b> 120 h  | <b>Contact hrs</b> | 60.0 h |

### Course offerings and teaching methods in academic year 2020-2021

|                |         |         |                   |        |
|----------------|---------|---------|-------------------|--------|
| A (semester 1) | English | Incheon | practicum         | 24.0 h |
|                |         |         | guided self-study | 12.0 h |
|                |         |         | lecture           | 24.0 h |

### Lecturers in academic year 2020-2021

|                            |      |                    |
|----------------------------|------|--------------------|
| Cirkovic Velickovic, Tanja | KR01 | lecturer-in-charge |
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### Offered in the following programmes in 2020-2021

|  | crdts | offering |
|--|-------|----------|
| <a href="#">Bachelor of Science in Environmental Technology</a>  | 4     | A        |
| <a href="#">Bachelor of Science in Food Technology</a>   | 4     | A        |
| <a href="#">Bachelor of Science in Molecular Biotechnology</a>   | 4     | A        |
| <a href="#">Joint Section Bachelor of Science in Environmental Technology, Food Technology and Molecular Biotechnology</a> | 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%