Chemical Structure Determination (I001966)

Valid as from the academic year 2018-2019

Course Specifications

Lecturers in academic year 2019-2020
Stevens, Christian
LA24

Course offerings and teaching methods in academic year 2019-2020
A (semester 1)  Dutch  self-reliant study activities
                     3.75 h
lecture                     18.75 h
seminar: coached exercises
                     17.5 h
guided self-study
                     5.0 h

Offered in the following programmes in 2019-2020

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<td>Master of Science in Bioscience Engineering: Cell and Gene Biotechnology</td>
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<tr>
<td>Master of Science in Bioscience Engineering: Chemistry and Bioprocess Technology</td>
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<td>Master of Science in Bioscience Engineering: Food Science and Nutrition</td>
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Teaching languages

Dutch

Keywords

Spectroscopy, NMR, IR, UV, MS

Position of the course

This course aims at teaching the principles of the different spectroscopical methods in organic chemistry and the applications of these methods in the field of bio-engineering. The transfer of knowledge and the efficient use of these techniques to solve analytical problems is the main objective of the course. The interpretation and combination of the spectral data will be highlighted in order to solve the molecular structure of organic compounds.

Contents

1. Spectroscopy and organic structure determination
2. General laws on energy absorption
3. Ultra Violet-Vis spectrometry
4. Infrared spectrometry
5. 1H-spectrometry
6. 13C-spectrometry
7. Mass spectrometry including degradation patterns
8. Combination of analytical techniques and structure determination

Initial competences

Chemical Structure Determination builds on certain learning outcomes of course units Chemistry 3: Organic chemistry - structure, and Chemistry 4: Organic chemistry - reactivity; or the learning outcomes have been achieved differently.

Final competences

1. To know and to understand the scientific background of the different spectroscopical techniques
2. The efficient use of the spectroscopical techniques to solve analytical problems regarding the structural identification of molecules.
3 The students need to be able to solve the organic structure of unknown compounds by the combination of different spectroscopical techniques.

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

Guided self-study, lecture, self-reliant study activities, seminar: coached exercises

Extra information on the teaching methods

Theory: lectures (24 hours)
Guided self study (6 hours)
Practical exercises: guided solving of spectral problems (15 hours)

Learning materials and price

Course material is available.

References

Course content-related study coaching

The study coaching will be performed by the assisting personnel of the department.

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

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

Written examination with open questions, written examination, open book examination

Examination methods in case of permanent evaluation

Written examination with open questions, open book examination

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible

Extra information on the examination methods

Theory: period aligned evaluation
Exercises: period aligned evaluation

The student will be evaluated on the theoretical and physical backgrounds of the spectroscopical methods and need to be able to apply this knowledge to solve the molecular structure of organic compounds.

Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examiner.

Theory: written (closed book) examination
Exercises: written (open book) examination

The students need to be able to interpret analytical data and be able to solve the structure of the molecules.

Calculation of the examination mark

Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examiner.

Facilities for Working Students

Students are not obliged to be present during the lectures.

(Approved)