Course Specifications
Valid as from the academic year 2018-2019

Chemical Structure Determination (I001966)

Course

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

Credits  4.0
Study time  120 h
Contact hrs  45.0 h

Course offerings and teaching methods in academic year 2018-2019

A (semester 1)  Dutch

seminar: coached exercises  17.5 h
lecture  18.75 h
guided self-study  5.0 h
self-reliant study activities  3.75 h

Lecturers in academic year 2018-2019

Stevens, Christian
LA24  lecturer-in-charge

Offered in the following programmes in  2018-2019

Master of Science in Bioscience Engineering: Cell and Gene Biotechnology  4  A
Master of Science in Bioscience Engineering: Chemistry and Bioprocess Technology  4  A
Master of Science in Bioscience Engineering: Food Science and Nutrition  4  A

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.

(Approved)
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 excercises: 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)