Course Specifications
Valid as from the academic year 2016-2017

Synthesis Strategy (C002955)

Course size
Credits 3.0
Study time 87 h
Contact hrs 15.0 h

Course offerings and teaching methods in academic year 2017-2018
A (semester 1) self-reliant study activities 3.75 h
lecture 11.25 h

Lecturers in academic year 2017-2018
Winne, Johan WE07 lecturer-in-charge

Offered in the following programmes in 2017-2018
Master of Science in Chemistry
Exchange Programme in Chemistry (master's level)

Teaching languages
English

Keywords
Organic synthesis, synthesis design, synthesis evaluation

Position of the course
This course unit is an elective course in the master degree.
The course intends to provide students insight into different methods used in the conception of a synthesis plan.
The following competences related to the master degree are relevant: M.2.4, M.2.5, M.3.1, M.3.4.

Contents
The course deals with these themes:
Strategy and economy in synthesis design; Repetitive synthesis; Hemisynthesis;
Asymmetric synthesis; Convergent total synthesis; Retrosynthesis; Transform-oriented synthesis;
Reconnective synthesis; Multiple bond construction; Inspiration and transpiration in organic synthesis;
Using scientific literature in synthesis design;
Examples of successful industrial asymmetric syntheses.

Initial competences
To have insight into the concepts that determine the structure and reactivity of organic molecules. To know the current synthetic methods.
To have successfully followed the courses "Introduction to organic structures", "Organic chemistry: reactivity 1, 2 and 3" and "Synthetic methods in organic chemistry" or to have acquired the relevant competences in another way.

Final competences
1 To explain and illustrate important concepts of synthetic planning using an example.
2 To analyse and evaluate the strategic-economic merit of synthetic pathways.
3 To identify key steps in a synthetic sequence.
4 To solve synthetic problems using scientific literature resources.
5 To analyse complex synthetic problems and independently suggest an appropriate synthetic method or strategy as potential solutions.
6 To conceive a synthetic pathway for a simple target molecule.

Conditions for credit contract
Access to this course unit via a credit contract is determined after successful competences assessment.

(Approved)
Conditions for exam contract
This course unit cannot be taken via an exam contract

Teaching methods
Lecture, self-reliant study activities

Extra information on the teaching methods
Students receive an individual assignment in which a synthetic plan should be suggested for a somewhat complex target molecule. Each student is assigned a different molecule, or can make a suggestion (for instance, after consulting with a master thesis promotor). Students are expected to use all available sources of information (books, research papers, internet search engines,...) to arrive at a viable and well-conceived synthetic plan. The suggested synthetic route will be discussed as part of the oral examination.

Learning materials and price
Syllabus in English. Cost: 5 EUR

References
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Course content-related study coaching
Oral explanation after electronic contact. Tutorial session about the individual assignment.

Evaluation methods
end-of-term evaluation

Examination methods in case of periodic evaluation during the first examination period
Written examination with open questions, open book examination, oral examination, assignment

Examination methods in case of periodic evaluation during the second examination period
Written examination with open questions, open book examination, oral examination, assignment

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation
not applicable

Extra information on the examination methods
The individual assignment should be regarded as an exam question for which students have been given the opportunity to have more time and resources than would be possible in a normal exam. Students are expected to bring their work along to the exam and discuss it during the oral examination. For the written part of the examination, individual use of any non-digital source of information is allowed (books, syllabi, lecture notes, ...). Examples of typical exam questions will be made available to students.

Calculation of the examination mark
The oral examination (“viva”) concerning the individual assignment contributes 50% of the total mark.