

CH-708

**Frontiers in Organic Synthesis. Part II Synthesis of carbo- and hetero-cycles**

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Cursus	Sem.	Type
Chemistry and Chemical Engineering		Obl.

Language of teaching	English
Credits	2
Session	
Exam	
Workload	60h
<b>Hours</b>	<b>46</b>
Courses	10
TP	36
<b>Number of positions</b>	<b>9</b>

**Frequency**

Every 3 years

**Remark**

Next time: Spring 2018

**Summary**

See content

**Content**

Following topics will be in the focus of the course:

- Synthesis and chemistry of indole and pyrrole derivatives
- Synthesis and chemistry of 6-membered ring heterocycles: pyridine, pyrimidine, pyrazine, piperidine, pyran,
- Synthesis and chemistry of 5-membered ring heterocycles: furan, thiophene, pyrrolidine, imidazole, pyrazole, triazole, thiazole, oxazole, tetrahydrofuran, pyrrolidine,
- Synthesis and chemistry of oxiranes, aziridines, oxetanes, azetidines,  $\beta$ -lactams and lactones
- Polycyclic heteroaromatic compounds: benzofuran, purine, quinoline, isoquinoline, quinoxaline, carbazole, (General Concept of the Lecture Series: A thorough knowledge and understanding of chemical transformations is essential for the synthetic chemist. In this course series, the student will become familiar with the recent methodological developments in organic chemistry. With the tools of modern chemistry, they will be able to design new efficient, economical and environmentally friendly reactions and synthesis. Every student will be assigned a specific topic of research. He will be expected to make a thorough literature research on his subject, including pioneering works, state of the art and most recent developments. He will present his results in to the class and the instructor and organize a short exercise session on the topic for the class.) Part II: Synthesis of Carbo- and Hetero- Cycles: In this part of the lecture, the students will learn methods to synthesize cyclic compounds efficiently. These skills are primordial for the pharmaceutical industry, as cyclic structures are ubiquitous in biologically active compounds. When familiar with the classical ways as well as the new development in this field, the student will be able to design the synthesis of structural diverse (hetero)-cyclic compounds to access diversity-oriented libraries.
- Diels-Alder and hetero-diels-alder reactions
- [3+2] cycloadditions: Huisgen Cycloaddition, Click-Chemistry and others
- Cyclization reactions for the synthesis of polycyclic compounds

**Note****Next session Spring 2018 (spread dates)**

oral exam based on the exercise sessions following the talk

**Keywords**

Heterocyclic Compounds, Medicinal Chemistry, Cyclization and Cycloaddition Reactions, Polycyclic Structure

**Learning Prerequisites**

**Required courses**

Master EPFL or Equivalen