

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		Opt.

Language of teaching	English
Credits	2
Session	
Exam	Multiple
Workload	60h
<b>Hours</b>	<b>46</b>
Lecture	10
Practical work	36
<b>Number of positions</b>	<b>9</b>

### Frequency

Every 3 years

### Remark

Postponed

### Summary

See content

### Content

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 environ-mentally 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 deversity-oriented libraries.

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, quina-zoline, carbazole,
- Diels-Alder and hetero-diels-alder reactions
- [3+2] cycloadditions: Huisgen Cycloaddition, Click-Chemistry and others
- Cyclization reactions for the synthesis of polycyclic compounds

### Keywords

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

### Learning Prerequisites

### **Required courses**

Master EPFL or Equivalen

### **Assessment methods**

2021:oral presentation (Zoom) at the symposium with questions by the teachers and all participants

### **Resources**

#### **Moodle Link**

- <https://go.epfl.ch/CH-708>