

CH-432

Structure and reactivity

Cramer Nicolai

| Cursus | Sem. | Type |
|------------------------------------|----------|------|
| Chemistry and Chemical Engineering | | Opt. |
| Chimiste | MA1, MA3 | Opt. |

| | |
|----------------------------|-----------------|
| Language of teaching | English |
| Credits | 3 |
| Session | Winter |
| Semester | Fall |
| Exam | Oral |
| Workload | 90h |
| Weeks | 14 |
| Hours | 2 weekly |
| Courses | 2 weekly |
| Number of positions | |

Summary

To develop a detailed knowledge of the key steps of advanced modern organic synthesis going beyond classical chemistry of olefins and carbonyls.

Content**1. Repetition of the chemistry of olefins and carbonyls**

- limitations

2. Rearrangements

- Sigmatropic: Claisen, Ireland-Claisen, Johnson-Claisen, Eschenmoser, Wittig, Evans-Mislow
 - Reactive intermediates : cations, carbenes, nitrenes

3. Cyclisations and Cycloadditions

- Pericyclic reactions
 - Diels-Alder (normal, hetero, inverse electron demand)
 - Dipolar cycloadditions

4. Radical- and Photochemistry**5. Strategy of Umpolung**

- Stoichiometric and catalytic

6. Metal-catalysis in Organic Chemistry

- Cross-coupling and metathesis
 - Olefins and C-H bonds functionalization
 - Synthesis of carbo- and heterocyclic systems

Learning Outcomes

By the end of the course, the student must be able to:

- Develop a detailed knowledge of the key steps of advanced modern organic synthesis going beyond classical chemistry of olefins and carbonyls

Transversal skills

- Assess one's own level of skill acquisition, and plan their on-going learning goals.
- Demonstrate the capacity for critical thinking

Teaching methods

ex cathedra lecture

Assessment methods

final oral exam

Resources

Websites

- http://scgc.epfl.ch/telechargement_cours_chimie

Moodle Link

- <https://go.epfl.ch/CH-432>