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