

Chemistry 647 - Organic Synthesis

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This course follows the organization indicated below and picks up where we left off in Chem 642 during the Spring Semester.

1. Finish the discussion of **The Diels-Alder Reaction**, its intramolecular version and applications in total synthesis.
2. **The Alder Ene Reaction** is covered in the context of the synthesis of five-membered rings. The Conia and transition metal catalyzed variants.
3. **[3,3]-Sigmatropic Rearrangements**. Claisen, Cope and oxy-Cope reactions are discussed in the context of total synthesis.
4. **Cation-Olefin Cyclizations** are discussed as another method for the synthesis of six-membered rings (other ring sizes too). The synthesis of the alkene starting materials is covered briefly, with greater emphasis on the choices of initiating and terminating functional groups.

Time permitting we will also cover the following topics:

5. **The Pauson-Khand Cyclization** and variants.
6. **The Nazarov Cyclization**; contemporary variants as methods of synthesis of five-membered rings.
7. **Synthesis of Five-Membered Rings** through C-H insertion reactions.
8. Methods for controlling **Stereochemistry in Acyclic Systems**. Nucleophilic additions to electron-deficient π -bonds: chelation control, Felkin-Ahn.

There is no required text for this course. Readings will be assigned from the primary literature. Students may find the following books useful:

“Strategic Applications of Named Reactions in Organic Synthesis” by László Kürti and Barbara Czakó

“Enantioselective Chemical Synthesis” by E. J. Corey and László Kürti