



Kursplan

för forskarkurs

Modern Methods and Strategies in Synthetic Organic Chemistry
Modern Methods and Strategies in Synthetic Organic Chemistry

7.5 Högskolepoäng
7.5 ECTS credits

Kurskod: KO40009
Gäller från: VT 2020
Institution Institutionen för organisk kemi

Förkunskapskrav och andra villkor för tillträde till programmet

Admitted to PhD studies

Lärandemål

After completion of the course the student should be able to:

- Demonstrate knowledge of enantioselective synthetic methods
- Demonstrate knowledge of applications of organometallic chemistry to organic synthesis
- Demonstrate knowledge of reaction mechanisms for these methods
- Perceive applications of enantioselective, organometallic, and other major methods in complex systems
- Apply this knowledge in the design of syntheses of natural products and other complex organic compounds
- Evaluate synthetic strategies and pathways

Innehåll

This course places emphasis on the methods and strategies of synthetic organic chemistry that have been developed, improved, and applied primarily since the year 2000. It is designed for participants who have previously studied organic reactions, mechanisms, and stereochemistry. The goal of the instructor is to build upon basic background material to familiarize the class participants with not only the methods that are commonly used in synthetic organic chemistry but also with the basic approaches for planning syntheses of complex organic compounds based upon the most recently developed methods.

After an introductory discussion of the basic concepts of synthesis design and other fundamental considerations including stereoselective synthesis, the course moves on to an in-depth coverage of synthetic methods and their applications. Special emphasis is placed on carbon-carbon bond forming reactions rather than functional group modifications such as oxidations and reductions. As a convenient vehicle for presenting these methods and the strategy of synthesis planning, the bulk of the course is centered mainly around the discussion of key types of reactive intermediates and their characteristic carbon-carbon bond forming reactions. Throughout the course, classical methods of synthesis are briefly mentioned followed by their most modern counterparts in order to contrast the old with the new. Examples of applications of these methods in the total synthesis of natural products will be presented at several points. Modern methods of asymmetric synthesis and organometallic chemistry are interspersed throughout this material.

The lectures are based on the primary literature rather than upon a specific textbook. Detailed lecture slides and literature citations will be provided to the participants in advance of the lectures. Although it will not be used in this course, a representative book such as "Classics in Total Synthesis III; Further Targets, Strategies, Methods" by Nicolaou and Chen (Wiley-VCH, 2011) would provide supporting background for the course materials.

Obligatoriska moment

Participation in lectures and seminars is compulsory. In the event of special circumstances, the examiner may, after consultation with the teacher concerned, grant a student exemption from the obligation to participate in certain compulsory instruction.

Examinationsformer

The course is examined as follows:

Knowledge assessment takes the form of a written exam and participation in seminars.

The course and examination language is English.

Grading (passed or failed) is related to the intended learning outcomes.

Grading criteria are handed out at the start of the course.

Students who receive a failing grade on a regular examination are allowed to retake the examination as long as the course is still given.

Arbetsform

Instruction (in English) consists of lectures and seminars.