Summary
This course discusses the molecular basis of diseases and how drugs work. Concepts and processes employed in today's drug discovery and development are covered. The first part of the course focuses on small molecule drugs and the second one on biotherapeutics.

Content
Lectures 1-5: The following five major disease areas as well as small molecule therapeutics applied to treat the diseases are discussed:
- cancer
- cardiovascular diseases
- neurologic disorders
- infectious diseases
- inherited diseases

Lectures 6-13: The following therapeutic formats being mostly biologics are discussed:
- blood and blood components
- enzymes
- hormones
- cytokines
- monoclonal antibodies
- antibody fragments and mimics
- macrocycles
- peptides and peptidomimetics

Keywords
pharmacological chemistry, drug discovery, biotherapeutics, biologics, small molecule drugs

Learning Prerequisites
Required courses
Basic knowledge in chemistry and biochemistry

Learning Outcomes
By the end of the course, the student must be able to:
- Describe molecular basis of diseases
- Describe small molecule drugs and biotherapeutics and their mechanism of action
• Recall drug development strategies that are discussed as case studies

Teaching methods
Each week, one of the above described topics is presented in a lecture (45 minutes) and a research paper is discussed (45 minutes).

Expected student activities
The students read each week a research paper and answer questions that are provided (at home). The students participate in the discussion of the paper in the lecture.

Assessment methods
Written exam

Resources
Notes/Handbook
The following materials are provided on Moodle:
- Handout for each lecture
- PPT presentation of the lectures and the case studies
- Research papers
- Questions about research papers