



LUND
UNIVERSITY

Faculty of Science

KEMM20, Chemistry: Medicinal Chemistry, 7.5 credits *Kemi: Läkemedelskemi, 7,5 högskolepoäng* Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2015-03-13 and was last revised on 2022-09-12. The revised syllabus applies from 2022-09-12, autumn semester 2023.

General Information

The course is an elective course in the second cycle for a degree of Master of Science in Chemistry.

Language of instruction: English

Main field of studies

Chemistry

Depth of study relative to the degree requirements

A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

On completion of the course, students are to have acquired basic knowledge and broad understanding of medicinal chemistry and pharmacological principles from a molecular perspective.

Knowledge and understanding

On completion of the course, the student shall be able to:

- describe the most common strategies for drug discovery and development
- describe common target molecules for drug development
- describe basic pharmacodynamic and pharmacokinetic concepts from a molecular perspective
- explain relationships between chemical structure and biological activity
- describe chemical principles for design and development of drug molecules
- name some of the most common drug compounds and their areas of use

Competence and skills

On completion of the course, the student shall be able to:

- discuss orally and in writing chemical, physical, and pharmacokinetic properties of given drug molecules
- describe and discuss drug action mechanisms from a molecular perspective based on conformational analysis, stereochemistry, acid-base chemistry and ligand-macromolecule interactions
- analyse a given molecular structure as a potential drug candidate

Judgement and approach

On completion of the course, the student shall be able to:

- analyse value and judge a given molecular structure as a potential drug candidate
- argue for their assessment and their standpoint regarding the potential of a given molecular structure as a drug candidate

Course content

The course discusses common target biomolecules for drug development, general pharmacokinetic/pharmacodynamic principles and strategies for drug discovery and development.

The course integrates organic, physical, theoretical chemistry, and biochemistry to describe how a given drug molecule can interact with a disease-relevant target biomolecule, as well as how drug molecules can be chemically optimized with respect to pharmacokinetic and pharmacodynamics properties.

Relationships between chemical structure and biological activity are central in the course. These are exemplified in the course with antiviral drugs, antibiotics, cancer drugs, drugs acting on the nerve system (adrenergic, cholinergic, and opiate receptors), and ulcer drugs. Biological pharmaceuticals are presented, discussed, and compared with small organic molecules from a drug perspective.

Course design

Teaching comprises lectures and exercises.

Assessment

Assessment takes the form of written continuous examination during the course. Students who do not pass the regular assessment will be offered an extra opportunity for assessment at the end of the course.

Students who did not pass an assessment in the regular session will be offered another opportunity for assessment during the scheduled period for resits.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass, Pass with distinction.

To be awarded Pass on the whole course, students must pass the continuous written examination.

To be awarded Pass with distinction on the whole course, students must receive 75 % right answers on the continuous written examination.

Entry requirements

To be eligible for this course students must have basic eligibility, english 6 and 90 higher education credits in completed Science courses, including passes in courses equivalent to:

- KEMA20 General Chemistry 15 credits
- KEMA01 Organic Chemistry - Basic Course 7.5 credits
- KEMA03 Biochemistry - Basic Course 7.5 credits and
- KEMB09 Physical Chemistry - Basic Course 15 credits

Equivalent knowledge that has been gained in another way also provides eligibility for the course.

Further information

The course replaces KEMM10 Chemistry: Medicinal Chemistry 7.5 credits and credits from that course cannot count towards a degree together with this course, or together with KEMC10 Chemistry: Pharmaceutical Science 7.5 credits.

The course is studied together with KOKN01/TFRP45 Medicinal Chemistry 7.5 credits which is a course at Lund University's Faculty of Engineering, LTH.

The course is assessed according to the LTH exam schedule.

Subcourses in KEMM20, Chemistry: Medicinal Chemistry

Applies from H23

2301 Medicinal Chemistry, examination, 7,5 hp
Grading scale: Fail, Pass, Pass with distinction

Applies from H15

1501 Medicinal Chemistry, 7,5 hp
Grading scale: Fail, Pass, Pass with distinction