



**LUND**  
UNIVERSITY

Faculty of Science

## **KEMM20, Chemistry: Medicinal Chemistry, 7.5 credits**

*Kemi: Läkemedelskemi, 7,5 högskolepoäng*

Second Cycle / Avancerad nivå

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### **Details of approval**

The syllabus was approved by Study programmes board, Faculty of Science on 2015-03-13 and was last revised on 2019-01-17. The revised syllabus applies from 2019-01-17, autumn semester 2019.

### **General Information**

The course is included in the main field of Chemistry at the Faculty of Science

The course is an optional second-cycle course 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**

The aim of the course is to give basic knowledge and broad understanding of medicinal chemistry and pharmacological principles from a molecular perspective.

### **Knowledge and understanding**

For a passing grade the student must

- be able to describe the most common strategies for drug discovery and development
- be able to describe common target molecules for drug development
- be able to describe basic pharmacodynamic and pharmacokinetic concepts from a molecular perspective
- be able to explain relationships between chemical structure and biological activity

- be able to describe chemical principles for design and development of drug molecules
- be able to name some of the most common drug compounds and their areas of use

### **Competence and skills**

For a passing grade the student must

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

### **Judgement and approach**

For a passing grade the student must

- 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**

The course is assessed with a written examination at the end of the course.

A re-sit examination is offered to students who do not pass.

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 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, or KEMA10 General Chemistry 7.5 credits and KEMA12 Inorganic Chemistry – Basic Course 7.5 credits, KEMA01 Organic Chemistry – Basic Course 7.5 credits and 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 may not be included in a degree together with KEMM10 Chemistry: Medicinal Chemistry 7.5 credits or KEMC10 Chemistry: Pharmaceutical Science 7.5 credits.

The course is given together with KOKN01 Medicinal Chemistry 7.5 credits at the Faculty of Engineering.

## Subcourses in KEMM20, Chemistry: Medicinal Chemistry

Applies from H15

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