



**Karolinska
Institutet**

Course syllabus for

Chemical Biology, 8 credits

Kemisk biologi, 8 hp

This course syllabus is valid from spring 2022.

Please note that the course syllabus is available in the following versions:

[Spring2018](#) , [Spring2021](#) , [Spring2022](#) , [Spring2023](#) , [Spring2025](#)

Course code	1BI039
Course name	Chemical Biology
Credits	8 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Biomedicine
Level	G2 - First cycle 2
Grading scale	Pass with distinction, Pass, Fail
Department	Department of Medical Biochemistry and Biophysics
Decided by	Programnämnden för biomedicinprogrammen
Decision date	2017-11-02
Revised by	Programme committee for study programmes in biomedicine
Last revision	2021-10-22
Course syllabus valid from	Spring 2022

Specific entry requirements

At least the grade Pass on the course Introduction to Biomedical Science and at least grade Pass on the part 1, Organic-chemical laboratory work, 5 hp, in the course General and Organic Chemistry, 12 credits.

Objectives

Upon completion of the course, the student should be able to:

Regarding knowledge and understanding:

- describe structures of biological macromolecules and explain at a basic level the most commonly occurring methods for determination and analysis of the three-dimensional structure of biomolecules,
- explain biophysical and chemical methods that are used to study the regulation and function of biomolecules,
- account for how chemical biology methods are used within biomedical research and pre-clinical drug discovery,

- discuss the use of chemical biology in biomedical research and pre-clinical drug discovery,

Regarding competence and skills:

- carry out and orally present chemical biology projects,
- perform basic chemical biology laboratory work safely and according to instructions,
- describe and analyse their own chemical biology laboratory work,
- analyse macromolecular structures,

Regarding judgement and approach:

- follow scientific ethical guidelines when documenting data and results,
- assess, evaluate and choose appropriate methods for basic chemical biology experiments.

Content

The course content is oriented towards chemical biology aspects of pre-clinical drug discovery as well as towards study of biological systems.

The course is divided into the following 2 parts:

Chemical biology project work and laboratory work, 4.0 hp

Grading scale: GU

Cover a chemical biology topic from different perspectives. Oral presentation of findings.

Commonly used methods in chemical biology laboratory work and computational data analysis. Written lab reports.

Integration of theory and practice, 4.0 hp

Grading scale: VU

Integration of theory and practice of chemical biology.

Teaching methods

The teaching includes lectures, laboratory sessions, computer laboratory sessions, group tuition (seminars) and project work. An emphasis is placed on problem-solving.

Examination

Part 1. Chemical biology project work and laboratory work (4 credits). The examination consists of oral presentation of the project work. Graded Fail/Pass. The examination of the laboratory work consists of written lab reports. Graded Fail/Pass. The performance in the laboratory sessions together with the results of lab reports can generate bonus points to be added to the points obtained in the final written exam (part 2), if the final exam is passed.

Part 2. Integration of theory and practice (4 credits). The examination consists of a written exam covering the entire contents of the course. Graded Fail/Pass/Pass with distinction.

To pass the whole course the grade of at least pass must have been obtained for all parts of the course. The final grade for the whole course is based on the result of the exam in part 2 combined with any bonus points earned from part 1.

Students that fail to submit compulsory assignments by the deadlines will lose the opportunity to be graded with pass with distinction on the course.

Compulsory participation

Laboratory sessions are compulsory, as well as other teaching occasions linked to these parts. Participation in regular project work discussions is compulsory. The course director assesses if and, in that case, how absence can be compensated. Before the student has participated in all compulsory parts or compensated absence in accordance with the course director's instructions, the student's results for respective part will not be registered in LADOK. Absence from a compulsory part may lead to that the student can't compensate the absence before the next time the course is given.

Limitation of number of examinations or practical training sessions

Students who have not passed the regular examination are entitled to participate in five more examinations. If the student has failed six examinations/tests, no additional examination or new admission is provided.

The number of times that the student has participated in one and the same examination is regarded as an examination session. Submission of a blank examination is regarded as an examination. An examination, for which the student registered but not participated in, will not be counted as an examination.

If there are special grounds, or a need for adaptation for a student with a disability, the examiner may decide to deviate from the syllabus's regulations on the examination form, the number of examination opportunities, the possibility of supplementation or exemptions from the compulsory section/s of the course etc. Content and learning outcomes as well as the level of expected skills, knowledge and abilities may not be changed, removed or reduced.

Other directives

The course language is English.

Course evaluation will be carried out in accordance with the guidelines established by the Board of Higher Education.

Oral evaluation in the form of course council meetings will be carried out during the course.

Literature and other teaching aids

Mandatory literature

Specific material referred to during the course forms the course literature.

Recommended literature

Miller, Andrew; Tanner, Julian

Essentials of chemical biology : structure and dynamics of biological macromolecules

Chichester, England : John Wiley & Sons, c2008. - xvi, 573 p.

ISBN:9780470845301 LIBRIS-ID:11235344

URL: [Länk](#)

Good book but lacks some coverage of "chemical biology" and esp drug discovery. A newer edition is in the pipeline which will be much better.

[Library search](#)

Van Vranken, David L.; Weiss, Gregory A.

Introduction to bioorganic chemistry and chemical biology

New York : Garland Science, cop. 2013 - xvii, 486 s.

ISBN:978-0-8153-4214-4 LIBRIS-ID:14717687

The book is an overall good introduction to chemical biology which covers a wide range of topics. Note: not all topics of the course are covered.

[Library search](#)

Structure-Based Drug Discovery

LIBRIS-ID:21113485

The book covers some crystallography esp. structure base drug discovery.