



**Karolinska
Institutet**

Course syllabus for

Biochemistry, 12 credits

Biokemi, 12 hp

This course syllabus is valid from spring 2025.

Course code	1BI051
Course name	Biochemistry
Credits	12 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	Programme committee for study programmes in biomedicine
Decision date	2024-10-10
Course syllabus valid from	Spring 2025

Specific entry requirements

At least the grade Pass (G) on the course Introduction to Biomedical Science, at least grade Pass (G) on the part Organic-chemical laboratory work, (5 credits), in the course General and Organic Chemistry, and the part Laboratory practicals (4 credits) of the course Cell-, stem cell and developmental biology, at the Bachelor's programme in Biomedicine

Objectives

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

Regarding knowledge and understanding:

- describe the biochemical functions and regulation of metabolic processes of individual human cells and organs,
- describe connections between metabolic processes at the molecular level and between various organs during health and disease.

Regarding competence and skills:

- discuss selected effects of pharmaceuticals, lifestyle, and genetic variation on metabolic processes at the level of cell and organ,
- search for and select relevant literature for specific topics covered in the course,
- present his/her own results and summaries of literature within the field of biochemistry, both

- verbally and in writing,
- perform and evaluate biochemical experiments,
- perform biochemical laboratory work in a safe manner.

Regarding judgement and approach:

- evaluate relevant methods for biochemical laboratory work,
- assess selected effects of lifestyle, such as exercise and nutrition, on metabolism and disease risk or prevention.

Content

Catabolism and anabolism, and general principles for turnover of intermediates and energy in biochemistry. Regulation and mechanisms of enzyme activity. Specific signal transduction systems of the cell. Carbohydrate and lipid metabolism - including energy conversions in the cell. Amino acid metabolism including urea cycle, one carbon pool and nucleotide metabolism. Adaptation of metabolism during physiological states or metabolic diseases, including the importance of oxidative stress and insulin resistance.

The course is divided into the following parts:

Biochemical laboratory methods, 3.0 hp

Grading scale: GU

Studies of cellular metabolism and the application of chromatographic methods in this field.

Metabolism in health and disease, 3.0 hp

Grading scale: GU

Integration of metabolism. Applying basic biochemical knowledge to various diseases and physiological conditions that demand different metabolic adaptations.

Integration of theory and practice, 6.0 hp

Grading scale: VU

Integration of theory and practice in biochemistry and metabolism.

Teaching methods

The teaching includes lectures, laboratory sessions, group tuition (seminars), and project works. The project works include peer feedback, group work, oral presentation, and discussion.

Examination

Voluntary intermediate tests. Passed intermediate tests can generate bonus points to be added to the points obtained in the final written exam (part 3), if the final exam is passed.

Part 1. Biochemical laboratory methods (3 credits). The examination consists of testing the student's laboratory skills and written laboratory reports. Graded Fail/Pass.

Part 2. Metabolism in health and disease (3 credits). The examination consists of oral presentations of project works, graded Fail/Pass.

Part 3. Integration of theory and practice (6 credits). The examination consists of a written examination. The written examination is graded Fail/Pass/Pass with distinction.

The course grade is based on the grade of the final written examination in part 3 combined with any bonus points earned from the voluntary intermediate tests. To pass the whole course, the grade Pass must have been obtained for all parts of the course.

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

Compulsory participation

Laboratory sessions and project work are compulsory, as well as presentations, quizzes and lectures linked to these parts. 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 the 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.

Limited 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.

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

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

Literature and other teaching aids

Biochemistry

Berg, Jeremy M.; Gatto, Gregory J.; Hines, Justin K.; Beneken Heller, Jutta; Tymoczko, John L.; Stryer, Lubert

Tenth edition, international edition. : Austin : Macmillan Learning, [2023] - xxxvii, 1001, A31, I44 Seiten

ISBN:1319498507 LIBRIS-ID:vcxshzhns5dfv8h9

[Library search](#)

Miesfeld, Roger L.; McEvoy, Megan M.

Biochemistry

Second edition. International student edition : New York N.Y. : W. W. Norton & Company, 2021 - xxviii, 1228, 56, 28, 50 sidor

ISBN:9780393533538 LIBRIS-ID:1ffnggtwzwx0jjfc

[Library search](#)

Lippincott illustrated reviews: Biochemistry

Abali, Emine Ercikan; Cline, Susan D.; Franklin, David S.; Viselli, Susan

Eighth edition, international edition : Philadelphia : Wolters Kluwer, [2022] - xi, 625 pages

ISBN:9781975155117 LIBRIS-ID:gvl8qzq3dxc5pb7b

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