



LUND
UNIVERSITY

Faculty of Science

BIOA10, Biology: Cell- and Microbiology, 15 credits

Biologi: Cell- och mikrobiologi, 15 högskolepoäng

First Cycle / Grundnivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2018-02-05 and was last revised on 2018-02-16. The revised syllabus applies from 2018-02-16, autumn semester 2018.

General Information

The course is compulsory for a Degree of Bachelor of Science in biology and molecular biology.

Language of instruction: Swedish

Main field of studies

Biology

Molecular Biology

Depth of study relative to the degree requirements

G1N, First cycle, has only upper-secondary level entry requirements

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Learning outcomes

Knowledge and understanding

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

- define what characterises living organisms and account for their origin, evolution, phylogeny and relationships at a general level
- give examples of model organisms in biological and molecular biological research
- account for the structures and organelles of the cell
- describe differences and similarities in the morphology and internal structure of different cell types (e.g. bacteria, plant cells and animal cells)

- account for specialised cells of the nervous system and the immune system
- account for basic energy transformations and energy metabolism in the cell
- describe the cell cycle
- describe the structure and replication of DNA
- account for the basics in sterilisation techniques, as well as cultivation, growth and quantification analyses of bacteria
- give examples of the importance of microorganisms for humans and the environment
- at a general level account for the scientific process, including hypothesis formulation and experimental design

Competence and skills

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

- apply taxonomic nomenclature to correctly name organisms and interpret phylogenetic trees
- use laboratory equipment for sterilisation, cultivation of bacteria, quantification analyses of bacteria, and for microscopic studies of different cell types
- calculate bacterial concentrations and make growth curves
- use relevant computer programs for data analysis
- interpret microscopy pictures of different cells and cell structures
- write a laboratory report

Judgement and approach

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

- demonstrate an understanding of the importance to review scientific statements
- discuss and demonstrate an understanding of the importance of the microorganisms for humans and the environment
- reflect on human activities of significance for the biological diversity

Course content

The course starts with an introduction to the origin, classification and diversity of organisms, including the definition and origin of life, phylogenies, systematics, taxonomy, the species concept, speciation and biogeography. Biological and molecular biological model organisms are introduced.

The course thereafter covers the structure and composition of cells in microorganisms, plants and animals. The structure and function of biomolecules such as proteins, nucleic acids and membranes are described. The course also includes mechanisms for energy transformation and its different stages. Cell differentiation and example of different specialised animal cells (e.g. from the nervous system and the immune system) is included, as well as the cell cycle, including mitosis, DNA structure and DNA replication.

The final part of the course is focused on bacteria systematics, growth and nutritional requirements. This part also includes methods for sterilisation and disinfection, effects of antibiotics on bacterial growth and examples of how microorganisms are used and influence man and the environment.

The concepts of hypothesis formation and experimental design are introduced.

Course design

The teaching consists of lectures, supervised self-studies, laboratory sessions, field trips and group work. Participation in laboratory sessions, field trips and group work and thereby integrated other teaching is compulsory.

Assessment

Examination takes place as written examinations during the course. For students who have not passed the regular examination, an additional examination in close connection to this is offered.

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.

Grades

Marking scale: Fail, Pass, Pass with distinction.

For a grade of Pass on the whole course, the student must have passed the written examinations and all compulsory parts. The final grade is determined by a weighing of the results of the parts that are included in the examination.

Entry requirements

General and courses corresponding to the following Swedish Upper Secondary School Programs: Biology 2, Chemistry 2, Mathematics 4, Physics 1b/1a1+1a2.

Further information

The course may not be included in qualification together with MOBA01 Cell biology 15 credits.