



Board of Teacher Education  
Biology

## Syllabus

### Biology and Biology Teaching 2

<b>Course Code:</b>	BIGBI2
<b>Course Title:</b>	Biology and Biology Teaching 2 <i>Biologi med didaktisk inriktning 2</i>
<b>Credits:</b>	30
<b>Degree Level:</b>	Undergraduate level
<b>Progressive Specialisation:</b>	First cycle, has less than 60 credits in first-cycle course/s as entry requirements (G1F)

**Major Field of Study:**  
BIA (Biology)

#### Course Approval

The syllabus was approved by the Board of Teacher Education 2018-08-29, and is valid from the Spring semester 2019 at Karlstad University.

#### Prerequisites

BIGBI1, with at least 7.5 ECTS credits completed, or equivalent

#### Learning Outcomes

The aim of the course is that students acquire the sound and relevant knowledge of biology and biology education required for teaching the subject. Students are expected to develop skills to stimulate pupils to learn more about living organisms and conditions for life, and basic skills in planning teaching and assessing pupils' performance.

Module 1 Cell Biology, 15 ECTS cr.

Upon completion of the module, students should be able to:

1. give an account of cell and virus structures, different cellular processes and functions such as protein synthesis, genetic and metabolic functions, and cell cycle and cell signal functions,
2. use sterilisation techniques, cell and molecular biological and microbiological methods of analysis,
3. analyse the possibilities and limitations of using verbal and visual communicative tools,
4. discuss different teaching strategies and reflect on how these can contribute to pupils' learning,
5. seek, critically assess, and discuss a relevant problem in the subject area from different perspectives, and
6. reflect on the possibilities and problems of using societal issues with a natural science content in teaching.

Module 2 Botany, 15 ECTS cr.

Upon completion of the module, students should be able to:

1. give an account of the diversity, structure, function and evolutionary relationships of plants,
2. provide an outline of the evolution of plants on earth,

3. explain foundational processes and principles of botany,
4. distinguish between different cell and tissue types with the help of a microscope,
5. give an account of how digital tools can be used in teaching botany to support learning,
6. discuss how an exploratory method of teaching can be applied to biology,
7. give an account of the photosynthesis, respiration and decomposition from a subject teaching perspective, and
8. discuss how pupils' attitudes to learning biology are affected by different background factors described in terms of biology education theories.

### **Content**

The course comprises two modules:

#### Module 1 Cell Biology, 15 ECTS cr.

The course centres on cell biology theory instructed in the form of lectures, discussions and study questions. Areas treated are biomolecules, virus structure and prokaryotic and eukaryotic cell structures. A number of different cellular processes and functions such as DNA replication, gene regulation, cell cycle regulation, mitosis and meiosis, cell signalling, protein synthesis and prokaryotic and eukaryotic metabolism.

The practical and methods-oriented part of the course involves laboratory experiments and report writing and treats sterilisation techniques, cell and molecular biological and micro biological analysis methods. The teaching methodological part of the course deals with how biological phenomena are communicated verbally and visually. On the basis of genetics problems and possibilities with different models are discussed. Teaching methods and teaching approaches are discussed. Students also develop skills in seeking information of societal relevance in the area, critically and ethically assessing, compiling and presenting it, as well as reflecting on how to use the information in teaching.

#### Module 2 Botany, 15 ECTS cr.

The course deals with the form, function, evolution and kinship of plants from an ecological perspective. Plants' needs of resources, their reaction to changes in the environment, the function of plant hormones and energy transformations in plant photosynthesis are treated in lectures and seminars. The course also includes fungi, algae, and plants in terms of systematic classification and morphology. Their outer and inner morphology is described with a special focus on its function and importance for their systematic classification. Various types of life cycles and reproductive systems are discussed. The course addresses the composition and function of morphological structures among groups of fungi, algae, and plants through the study of samples and microscope slides. Students also partake in a multi-week experiment to clarify important processes in plant life, and make experiments with plant photosynthesis, and examine cell types and tissue through the microscope in preparation for anatomy quizzes.

### **Reading List**

See separate document.

### **Examination**

Assessment is based on:

#### Module 1

Learning outcome 1: written exam

Learning outcome 2: laboratory work and lab reports

Learning outcomes 3-6: individual hand-in assignments and seminars.

#### Module 2

Learning outcomes 1-4: individual quizzes

Learning outcomes 5-8: individual hand-in assignments, oral presentation and seminar.

**Grades**

One of the grades Distinction (VG), Pass(G), or Fail (U) is awarded in the examination of the course.

**Quality Assurance**

Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course evaluation is partly based on student views and experiences obtained in accordance with current regulations and partly on other data and documentation. Students will be informed of the result of the evaluation and of any measures to be taken.

**Course Certificate**

A course certificate will be provided upon request.

**Additional information**

The local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.

Teacher education programme: secondary schools