

# Syllabus

for course at advanced level

**Green Biotechnology**  
**Grön bioteknik**

**15.0 Higher Education  
Credits**  
**15.0 ECTS credits**

<b>Course code:</b>	BL7051
<b>Valid from:</b>	Spring 2017
<b>Date of approval:</b>	2016-11-21
<b>Department</b>	Department of Biology Education
<b>Main field:</b>	Biology
<b>Specialisation:</b>	A1N - Second cycle, has only first-cycle course/s as entry requirements

## Decision

This syllabus has been approved by the Board of the Faculty of Science at Stockholm University.

## Prerequisites and special admittance requirements

Admission to the course requires knowledge equivalent to Physiology 15 ECTS credits and Cell and Molecular Biology 27 ECTS credits, alternatively, 120 ECTS credits in Natural Science/Technology including Physiology 15 ECTS credits. Swedish upper secondary school course English B/English 6 or equivalent.

## Course structure

Examination code	Name	Higher Education Credits
DEL1	Theory	4.5
DEL2	Literature Study and Bioinformatic Project	3
DEL3	Research project	7.5

## Course content

The course deals with the application of biological processes and molecules of plants and other photosynthesizing organisms and addresses, among other things, their use in agriculture (insect resistance, increased nutrient content, stress tolerance) and in the industry where photosynthesizing organisms can generate industrially important products / substances (pharmaceutical substances, long chain fatty acids, vitamins, enzymes, fibers, color pigments, biofuels, etc.). The course will also provide an in-depth knowledge of the life processes of plants as well as how plants and other photosynthesizing organisms interact with each other and their environment. The course covers the molecular biology of the plant cell and focuses on biotechnology that can be applied to photosynthesizing organisms. The biotechnology that the course covers is based on functional genomics and proteomics; plant breeding (e.g., with marker-assisted selection) and quantitative genomics; genetically modified plants; phytoremediation as well as the bioactive compounds of plants and how they can be utilized. The course will also touch on how plants can be used in today's industry, for example to develop new products or new eco-technology.

b. The course consists of the following course units: 1. Theory 4.5 credits 2. Literature study and bioinformatics project 3 credits 3. Research project 7.5 credits

## Learning outcomes

Upon completion of the course, students are expected to be able to:

Unit 1, Theory, 4.5 credits:

- describe the critical role of plants in our biosphere and present knowledge and current research related to

photosynthesizing organisms.

Unit 2, Literature study and bioinformatics project, 3 credits:

- present knowledge and current research related to photosynthesizing organisms and independently plan and execute basic methodology in bioinformatics and independently report results in the area
- Unit 3, Research projects, 7.5 credits:
- independently plan and execute projects and evaluate results obtained in the area and present these orally and in writing

### **Education**

Instruction consists of lectures, group discussions, laboratory project work, demonstrations and seminars. Participation in group discussions, seminars, project work, demonstrations and any associated integrated instruction is compulsory. In the event of special circumstances, the examiner may, after consultation with the teacher concerned, grant a student exemption from the obligation to participate in certain compulsory instruction.

### **Forms of examination**

a. The course is examined as follows: Knowledge assessment of unit 1 takes the form of written examinations. Knowledge assessment of unit 2 and 3 takes the form of oral and written examinations.

If the instruction is in English, the examination may also be conducted in English.

b. Grades will be set according to a seven-point scale related to the learning objectives of the course:

A = Excellent

B = Very good

C = Good

D = Satisfactory

E = Adequate

Fx = Fail, some additional work required

F = Fail, much additional work required

c. The grading criteria will be distributed at the beginning of the course.

d. In order to pass the course, students must receive a passing grade on all course units and participate in all mandatory instruction.

The final grade on the course is determined by weighting the grades from all course units, where each grade is weighted in relation to the scope of the course unit.

e. Students who receive a failing grade on a regular examination are allowed to retake the examination as long as the course is still provided. The number of examination opportunities is not limited. Other mandatory course elements are equated with examinations. A student who has received a passing grade on an examination may not retake the examination to attain a higher grade. A student who has failed the same examination twice is entitled to have another examiner appointed, unless there are special reasons to the contrary. Such requests should be made to the department board.

The course includes at least two examination opportunities for each course unit per year when the course is given. At least one examination opportunity will be offered during a year when the course is not given.

f. Students awarded the grade Fx are given the opportunity to improve their grade to E. The examiner decides the supplementary assignments to be performed and the pass mark criteria. The supplementary assignments will take place before the next examination session.

### **Interim**

Students may request that the examination be conducted in accordance with this course plan even after it has ceased to be valid. However, this may not take place more than three times over a two year period after course instruction has ended. Requests must be made to the departmental board. The provision also applies in the case of revisions to the course plan (and the revisions of the course literature).

### **Misc**

The course is part of the Master's Programme in Biology and it can also be taken as a separate course.

### **Required reading**

The course literature is decided by the department board and published on the course page in the online course catalogue at least two months before the start of the course.