



## DEPARTMENT OF BIOLOGICAL AND ENVIRONMENTAL SCIENCES

### **BIO506 Plant ecophysiology in a global change perspective, 15 credits**

Botanisk ekofysiologi ur ett klimatperspektiv, 15 högskolepoäng

*Second Cycle*

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#### **Confirmation**

This course syllabus was confirmed by Department of Biological and Environmental Sciences on 2015-08-11 and was last revised on 2023-11-13 to be valid from 2023-11-13, spring semester of 2024.

*Field of education:* Science 100%

*Department:* Department of Biological and Environmental Sciences

#### **Position in the educational system**

The course is an advanced course in biological and environmental sciences at second cycle level. The course is included in the profile Ecophysiology within the Biology Master's programme (120 credits) and in the Environmental Master's (120 credits) programmes Atmosphere, Climate and Ecosystem as well as Environmental Science (natural science), but can also be included as elective course in other Master's (120 credits) programmes at the faculty as well as be read as a freestanding course.

The course can be part of the following programmes: 1) Atmosphere, Climate and Ecosystems, Master's Programme (N2ACE), 2) Environmental Sciences (N2MVN) and 3) Biology, Master's Programme (N2BIO)

#### *Main field of studies*

Biology

Environmental Science

#### *Specialization*

A1N, Second cycle, has only first-cycle course/s as entry requirements

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#### **Entry requirements**

At least 120 hp (credits), of which at least 30 credits in Biology as well as further 30 credits at advanced level in Biology/Environmental sciences/Chemistry/Geology/Physics,

or the equivalent.

## Learning outcomes

### *Knowledge and understanding*

Upon successful completion of the course, the student should have good knowledge about:

- The basic preconditions for the productivity of plants in different environments with an emphasis on forest and agriculture ecosystem
- How plants react on stress and disturbances in the environment
- The principles and regulating factors for energy, water, carbon and nutrient balances on plant and ecosystem levels
- Interaction between soil, vegetation and atmosphere particularly with regard to influences by ecosystem processes and land use changes on climate

### *Competence and skills*

The student is supposed to have obtained practical experience of:

- experimental design, methods of measurement and implementation of project work
- simple modelling to examine and calculate responses on changes in environment with regard to flows of energy, water, carbon and other nutrients

### *Judgement and approach*

The student is supposed to have practiced his critical approach by:

- participation in seminars, which format are set up by the students
- interpreting, presenting and discussing the data collected during project work

The course is sustainability-focused, which means that at least one of the learning outcomes clearly shows that the course content meets at least one of the University of Gothenburg's confirmed sustainability criteria. The content also constitutes the course's main focus.

## Course content

The course will give advanced knowledge in how plants' physiology and processes in their ecosystems respond to different environmental factors as well as how plants interact with their environment to take up, use and circulate resources with emphasis on carbon, water and nutrient. These responses and processes are particularly considered in relation to global environmental changes (temperature, carbon dioxide concentration, precipitation, nitrogen deposition, groundlevel ozone etc). The course is interactive and

contains, in addition to lectures, practical work in the field and laboratory, theoretical modelling exercises, own presentations and seminars.

#### *Sub-courses*

1. **Plant ecophysiology in a global change perspective: part 1 theory** (*Plant ecophysiology in a global change perspective: part 1 theory*), 12 credits  
Grading scale: Pass with Distinction (VG), Pass (G) and Fail (U)
2. **Plant ecophysiology in a global change perspective: part 2 ecophysiological project** (*Plant ecophysiology in a global change perspective: part 2 ecophysiological project*), 3 credits  
Grading scale: Pass (G) and Fail (U)

#### **Form of teaching**

The teaching is conducted in the form of lectures, seminars, laboratory sessions, exercises and field trips. The course is completed with a project work in groups with written and oral presentation. Except lectures, all course components are compulsory, since they develop the skills and approaches that are included in the learning objectives in a way that is not possible through self-study. The course consists of about 10 weeks of full-time studies and is divided into two parts: theory 12 credits, project work 3 credits.

*Language of instruction:* English

#### **Assessment**

Examination takes place through written examination, active participation in seminars, individual project work, as well as presentation of result of laboratory sessions and field exercises in groups. The course has compulsory components in the form of seminars, field trips and laboratory sessions.

If a student, who has been failed on the same examining course component twice, wishes a change of examiner before the next examination session, a request of this kind is to be sent in writing to the department responsible for the course, and granted, unless there are special reasons to the contrary (Chapter 6, Section 22, Higher Education Ordinance).

In the case where a course has been discontinued or has undergone major changes, the student will normally be guaranteed access to at least three examination sessions (including the regular examination session) during a period of at least one year on the basis of the course's former structure.

**Grades**

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U). The theoretical part is graded with Pass with Distinction (VG, 80-100%), Pass (G, 50-79%) and Fail (U, <50%). In addition, participation is required on the mandatory activities on the course. The project work is graded with Pass or Fail only. Both the theoretical part and the project work must be passed to pass the entire course. The grade on the theoretical part will then form the basis for the grade on the entire course.

According to decision in the board of the Faculty of natural sciences (26/02/2015, diary number: 2015/177) should all programmes and courses at the Faculty of natural sciences use either the three-graded scale: Fail, Pass or Pass with distinction, or the two-grade scale: Fail or G.

**Course evaluation**

Written and oral course evaluation are arranged at the end of course. Result of the evaluation will be posted at the course webpage. Changes that have been made to improve the course as response to criticism and views will be revealed for next year students.

**Additional information**

This course replaces BIO415 and ES2414, these can therefore not include in the same qualification as BIO506 or include in two different exams when one exam is based on the other.