



## DEPARTMENT OF BIOLOGICAL AND ENVIRONMENTAL SCIENCES

### **BIO566 Stream Ecology and Fish Conservation, 15 credits**

Ekologi och fiskevård i rinnande vatten, 15 högskolepoäng

*Second Cycle*

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#### **Confirmation**

This course syllabus was confirmed by Department of Biological and Environmental Sciences on 2013-09-24 and was last revised on 2024-03-12 to be valid from 2024-03-12, 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 in-depth course on second cycle level. It can be included in the bachelor and master programmes in biology, marine sciences and environmental sciences. It can also be taken as a freestanding course and be a part of other programmes.

The course can be part of the following programme: 1) Biology, Master's Programme (N2BIO)

#### *Main field of studies*

Marine Sciences

Environmental Science

Biology

#### *Specialization*

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

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#### **Entry requirements**

##### **Option 1**

At least 120 ECTS, of which at least 30 ECTS in Biology and a further 30 ECTS of passed in-depth courses in Biology/Environmental Science/Chemistry/Geology/Physics, or equivalent.

## Option 2

90 ECTS approved out of 120 ECTS on courses within the first two years of Marine science, bachelor's program, University of Gothenburg or equivalent. In addition, at least one approved in-depth course in biology is required, 15 ECTS.

For both alternatives, applicants must also prove their knowledge of English corresponding to English 6/English B from Swedish upper secondary school. For more information, see English language requirements on [Universityadmissions.se](http://Universityadmissions.se).

## Learning outcomes

After completing the course, students should be able to:

### *Knowledge and understanding*

- Explain how some selected chemical and physical properties vary along a stream and how they affect the distribution of organisms
- Understand the nutrient cycles in streams
- Describe common freshwater organism in relation to their ecological function
- Explain how competition and predation can affect population dynamics and community structure in running water
- Explain how interactions between trophic levels can affect the properties both upward and downward in food chains

### *Competence and skills*

- Calculate flow and nutrient substance transportation in rivers
- Estimate the water quality based on physical and biological characteristics of the watercourse
- Design appropriate survey methods to describe and classify a stream according to its nutritional state
- Propose and implement appropriate restoration of running water to create and maintain a viable fish stock and ecosystem
- Estimating fish density using electrofishing
- Demonstrate proficiency in oral and written presentation

### *Judgement and approach*

- Experience in critically reviewing scientific articles
- Identify, prioritize and evaluate the environmental problems around watercourses

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**

This course will complement and enhance the understanding of aquatic ecology, specializing in running water and addresses both basic scientific and applied aspects. Both abiotic and biotic factors in a watercourse will be studied and how these relate to and are affected by adjacent terrestrial ecosystems. The focus is on ecological processes; competition, predation, food webs and trophic dynamics but also nutrient transport and flow calculations are key components.

Great emphasis is also placed on practical habitat restoration work related to conservation of ecosystems in running waters. Students will receive training in various methods for estimating the production of fish (electrofishing) and restoration of habitats in running water according to standardized methods. Students will also learn to identify various benthic organisms and its ecological role in running waters.

### **Form of teaching**

The course consists of lectures, seminars, laboratory work, field excursions and individual work in both written and oral form.

*Language of instruction:* English

### **Assessment**

The theory part is examined in a written exam. The literature project is examined using scores from a given grading criteria. Mandatory elements of the course, besides the exam are laboratory work, field trips and other group exercises as shown in the course schedule.

If a student who has twice received a failing grade for the same examination component wishes to change examiner ahead of the next examination session, such a request should be made to the department in writing and should be approved by the department unless there are special reasons to the contrary (Chapter 6 Section 22 of the Higher Education Ordinance).

If a student has received a recommendation from the University of Gothenburg for study support for students with disabilities, the examiner may, where it is compatible with the learning outcomes of the course and provided that no unreasonable resources are required, decide to allow the student to sit an adjusted exam or alternative form of assessment.

In the event that a course has ceased or undergone major changes, students are to be guaranteed at least three examination sessions (including the ordinary examination session) over a period of at least one year, but no more than two years after the course

has ceased/been changed. The same applies to internships and professional placements (VFU), although this is restricted to just one additional examination session.

### **Grades**

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).

There are three parts in the course: a theoretical part, sampling methodology and a literature project. The theoretical part and the literary project are graded Fail (U), Pass (G) or Pass with Distinction (VG). For the sampling methodology only Fail (U) and Pass (G) are used. Grades are given for the entire course and all three parts must be passed for a pass on the course (G). For a pass with distinction (VG), the sampling methodology must be graded with a pass. In addition to this, the combined results on the theoretical part and the literature project must be at least 85%.

### **Course evaluation**

Oral and written evaluation will take place in the end of the course. The course evaluation will be distributed to all teachers who participated in the course and should be taken into account when planning the next course. A summary of the course evaluation and the possible changes undertaken are presented for the next course during the introduction.