



## Course syllabus

Faculty of Health and Life Sciences

Department of Biology and Environmental Science

1MX046 Industriell ekologi, 7,5 högskolepoäng

Industrial Ecology, 7.5 credits

### **Main field of study**

Environmental Science

### **Subject Group**

Environmental Science

### **Level of classification**

First Level

### **Progression**

G1N

### **Date of Ratification**

Approved by Faculty of Health and Life Sciences 2020-01-20

The course syllabus is valid from autumn semester 2020

### **Prerequisites**

General entry requirements and Mathematics 3b / 3c, Science studies 2 or Mathematics C, Science studies B (Field-specific entry requirements 3/A3). Science B/2 can be replaced by Physics A/Physics 1 and Chemistry A/Chemistry 1.

## Objectives

The student should be able to:

- briefly describe a broad view of urban and urban industrial ecology, the interaction between nature's cycle and the anthropogenic cycle, the relationship between industry and the environment and the Triple/Quadruple Helix concept,
- describe the basics of hydrology and waste technology and the relationships between air, water, waste and soil-related environmental problems,
- optimize the total material cycle from virgin material to the final product and the handling of the end-of-life product including "zero waste" and "beyond zero waste" the waste concept in modern circular economy,
- critically analyze social, economic and environmental perspectives on design and sustainable development of industrial processes and products,
- propose and motivate different handling of residual products and recyclable substances and analyze the importance of good material selection and product quality as well as related environment.

## Content

Urban and industrial ecology are the core elements of the course in which combination of waste and water management has great importance for sustainable development. The course gives an overview of local, regional and global environmental impacts regarding air, land and water and gives information on common methods used in industrial ecology, e.g. process/product design and choice between different material alternatives in production. From a scientific point of view, the course focuses on circular economy and sustainable methods for recycling products, metals and nutrients. The course takes a multidisciplinary approach to environmental problems based on the TripleHelix concept.

## Type of Instruction

The course is given in English.

The teaching consists of lectures and group work, which is conducted in English.

The course is given over a digital learning platform which requires access to a computer, Internet connection and headset.

## Examination

The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).

Examination is done by assessing group work that is presented in writing English as well as an individual written home exam. All examinations constitute basis for a weighted grade on the course.

Repeated examination is offered in accordance with Local regulations for courses and examination at the first and second-cycle level at Linnaeus University.

If the university has decided that a student is entitled to special pedagogical support due to a disability, the examiner has the right to give a customised exam or to have the student conduct the exam in an alternative way.

## Course Evaluation

During the implementation of the course or in close conjunction with the course, a course evaluation is to be carried out. Results and analysis of the course evaluation are to be promptly presented as feedback to the students who have completed the course. Students who participate during the next course instance receive feedback at the start of the course. The course evaluation is to be carried out anonymously.

## Credit Overlap

The course cannot be included in a degree along with the following courses of which the content fully, or partly, corresponds to the content of this course: Industrial Ecology, 7.5 credits (1MX009, 1MX509)

## Required Reading and Additional Study Material

### **Compulsory literature**

Selected scientific articles, reports and supplementary literature (70-80 pages) will be announced at the start of the course.

Graedel, T.E., Allenby, B.R. (2010). Industrial ecology and sustainable engineering, Pearson Education Inc., ISBN 9780138140342. 425 p.