

SYLLABUS

Wastewater Treatment 7.5 credits V7012B

Avloppsvattenbehandling

Course syllabus admitted: Autumn 2017 Sp 1 - Autumn 2019 Sp 2

**DECISION DATE
2017-06-16**

Wastewater Treatment 7.5 credits V7012B

Avloppsvattenbehandling

Second cycle, V7012B

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	G U 3 4 5	VA-teknik	Civil Engineering

Entry requirements

V0016B Urban Water Systems or corresponding.

Selection

The selection is based on 30-285 credits

Examiner

Inga Herrmann

Course Aim

After the course you shall be able to

- explain why wastewater has to be treated and which systems that can be applied to take care of the wastewater,
- describe how treatment processes can be arranged and built at a wastewater treatment plant and know what parts that are critical for the function of the treatment,
- dimension and optimize individual process units for wastewater and sludge treatment,
- suggest site specific improvements of existing wastewater systems with theoretical and practical approaches,
- decide how/if all flows to the wastewater treatment plant should be treated, considering infiltration and inflows and sewer overflows along the sewers,
- explain how decisions regarding environment on EU, country and authority levels influence assessment of environmental impacts and supervision of wastewater systems,
- describe environmental impacts of wastewater systems and prerequisites for efficient resource handling,
- assess the status of treatment processes with laboratory and field investigations.

Contents

This course gives a broad overview of urban wastewater treatment and its tool box of mechanical, biological and chemical treatment processes for both wastewater and sludge. Beside knowledge of processes and ability to dimension and optimize different units to a well-functioning system, the course will also contribute with knowledge to be able to assess if existing plants need to be improved, to be able to improve built structures (preferable in house) in an innovative way, and be able to assess if flow variations influence the treatment processes in such a way that additional treatment steps are needed. In the course the impacts of the status of the sewer system on the function of the wastewater treatment plant is dealt with, for instance in relation to infiltration and inflows and what consequences this can result in concerning overflows, permissions and supervision from a juridical perspective. The environmental laws and regulations that influence the permissions and supervision of wastewater treatment plants are also dealt with in this course as well as the present change of the view of the wastewater treatment plant from a system for wastewater purification to a system that focus on resource efficiency.

Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

In the course, lectures with calculation tasks, laboratory lessons and a larger seminar are given. Beside that, the students work with an assignment report and a literature assignment. Laboratory lessons, the lessons connected to the seminar assignment and the oral presentations are mandatory.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided.

The objectives of the wastewater treatment, the environmental impacts of wastewater systems, suitable systems and lay out of treatment processes as well as dimensioning and optimization of processes are examined by a written exam in the end of the course. In this written exam, the knowledge concerning environmental laws and regulations related to assessment of environmental impacts and supervision of wastewater treatment systems is examined as well. The course aim related to which flows that need to be treated is examined by an assignment report. Knowledge concerning resource efficiency is examined by a literature assignment. The ability to suggest site specific improvements of existing systems is examined by a seminar assignment. Examination of knowledge concerning assessment of the status of treatment processes is examined by a laboratory task.

Overlap

The course V7012B is equal to V7013B

Literature. Valid from Autumn 2016 Sp 1

Wastewater Engineering: Treatment and Resource Recovery
Av Metcalf & Eddy Inc.
Upplaga 5 International ed

Course offered by

Department of Civil, Environmental and Natural Resources Engineering

Items/credits

Number	Type	Credits	Grade
0001	Written exam	4.5	G U 3 4 5
0002	Seminar assignment	1	U G#
0003	Assignment report	0.6	U G#
0004	Literature assignment	1.1	G U 3 4 5
0005	Laboratory work	0.3	U G#

Last revised

by Assistant Director of Undergraduate Studies Eva Gunneriusson, Department of Civil, Environmental and Natural Resources Engineering 2017-06-16

Syllabus established

by Eva Gunneriusson 2016-02-09