

**SYLLABUS**

# **Advanced dam design 7.5 credits G7007B**

**Dambyggnad - avancerad kurs**

**Course syllabus admitted: Spring 2019 Sp 4 - Spring 2021 Sp 4**

**DECISION DATE  
2019-01-11**

# Advanced dam design 7.5 credits G7007B

## Dambyggnad - avancerad kurs

### Second cycle, G7007B

<b>Education level</b>	<b>Grade scale</b>	<b>Subject</b>	<b>Subject group (SCB)</b>
Second cycle	G U 3 4 5	Geoteknik	Civil Engineering

## Entry requirements

Basic course in dam design, soil mechanics, structural mechanics and hydraulics.

## Selection

The selection is based on 30-285 credits

## Examiner

Jan Laue

## Course Aim

The aim is to provide the students with knowledge about structure and function of hydropower dams and tailings dams. Further to understand how the deterioration processes affect the function of dams and what type of repair method can be used.

The specific goals for the course are:

You must know:

- How dams are designed and constructed
- The function of different parts of dams
- Filter, filter function and drainage layers
- How filters are designed and constructed
- Calculate stability of dams
- Design of a soil and rock embankment dam

You will be able to apply:

- Calculation tools for slope stability
- Calculation tools for pore water pressure
- Design criteria for erosion protection and rip-rap
- Methods for calculation of erosion due to wave action

You should understand:

- Impact of internal and external erosion
- Deterioration mechanisms
- Development of sink-holes
- Water seepage through a dam

You will have some knowledge of:

- Different parts of dams and their functions
- Safety improvement methods for embankment dams
- Methods for repair of dams
- Sampling in dams
- The use of seismic methods in dam design
- Impact of climate change on dams

## Contents

Dam design and dam construction  
Filter criteria and filter rules  
Erosion processes  
Impact of wind and water on dams  
Long term stability of dams  
Investigation methods and sampling methods in dams  
Hydraulic design  
Study trips and field excursions

## Realization

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

Lectures and assignments, seminar assignment and design assignment regarding tailings dams or water retention dam.

## 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. Oral examination in relation to the presentation of the seminar assignment with differentiated grades and approved assignments.

## Literature. Valid from Autumn 2007 Sp 1

Distributed lecture material.

Vattenfall: Dammar och dammbyggnad

Hydropower Development vol 8 and 10, Tapir förlag, Trondheim, Norge

ICOLD bulletin Tailings dam safety

## Course offered by

Department of Civil, Environmental and Natural Resources Engineering

## Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0001	Oral exam	G U 3 4 5	1.5	Mandatory	A07	
0002	Seminar assignment	U G#	3	Mandatory	A07	
0003	Project work	U G#	3	Mandatory	A07	

## Last revised

by Assistant Director of Undergraduate Studies Eva Gunneriusson, Department of Civil, Environmental and Natural Resources Engineering 2019-01-11

## Syllabus established

The plan is established by the Department of Civil and Environmental Engineering 2007-01-31 and is valid from H07.