

**SYLLABUS**

# **Hydromechanics 7.5 credits**

## **F0031T**

**Hydromekanik**

**Course syllabus admitted: Autumn 2023 Sp 1 - Present**

DECISION DATE  
**2021-02-17**

# Hydromechanics 7.5 credits F0031T

## Hydromekanik

### First cycle, F0031T

<b>Education level</b>	<b>Grade scale</b>	<b>Subject</b>	<b>Subject group (SCB)</b>
First cycle	G U 3 4 5	Strömningslära	Engineering Physics

### Main field of study

Energy Engineering

## Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language and M0029M Calculus, M0030M Linear Algebra and Calculus, M0031M Linear Algebra and Differential Equations, F0004T Physics 1, F0006T Physics 3 or equivalent.

## Selection

The selection is based on 1-165 credits.

## Course Aim

After completing the course, the student will

- Know, be able to describe and apply basic physical concepts in hydromechanics and methods for analysis of fluids at rest and in motion that include:
  - Hydrostatics (Pascal's law. Forces on flat and curved surfaces, pressure center, Archimedes' principle, stability)
  - Basic relationship for streaming media (kinematics, control volume, continuity equation, Bernoulli's equation, momentum laws, energy principle)
  - Model experiments and similarity laws (dimensional analysis, Pi theorem)
  - Losses in laminar / turbulent flow (friction factors, one-time losses, surface roughness)
- Know, be able to describe and analyze technically important cases such as:
  - Pumps and piping systems (velocity diagram, pump equation, laws of similarity, pump curves)
  - Water turbines (impulse and reaction turbines, turbine equation, velocity diagram)

## Contents

The course deals with basic physical concepts in hydromechanics and methods for analysis of fluids at rest and in motion, model experiments and similarity laws and losses in laminar / turbulent flow.

## Realization

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

Lectures, classroom teaching and laboratory experiment.

## 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 teaching takes place in the form of lectures, lessons, and laboratory work. The laboratory work is a compulsory part.

## Unauthorized aids during exams and assessments

If a student, by using unauthorized aids, tries to mislead during an exam or when a study performance is to be assessed, disciplinary measures may be taken. The term “unauthorized aids” refers to aids that the teacher has not previously specified as permissible aids and that may assist in solving the examination task. This means that all aids not specified as permissible are prohibited. The Swedish version has interpretative precedence in the event of a conflict.

## Overlap

The course F0031T is equal to MTM119

## Course offered by

Department of Engineering Sciences and Mathematics

## Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0002	Laboratory work	U G#	0.9	Mandatory	A07	
0003	Written exam	G U 3 4 5	6.6	Mandatory	A21	

## Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

## Last revised

by Head Faculty Programme Director Niklas Lehto 2021-02-17

## Syllabus established

by Department of Applied Physics and Mechanical Engineering 2010-08-07