SG2218 Turbulence 7.5 credits

Turbulens

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for SG2218 valid from Autumn 2025

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Specific prerequisites

Finished course in Fluid Mechanics on Master's level, at least 7.5 credits.

English B / English 6

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

The primary aim of the course is to give the students an overview of turbulent flows.

After completing the course a student should be able to;

- use statistical methods to describe and analyse turbulent flow.
- describe and explain the length scales and structure of turbulence.
- simplify the governing equations for specific flow cases, and derive the averaged momentum balances and scaling laws.
- Understand the description of turbulent flows close to solid walls (turbulent boundary layer).
- apply common turbulence modelling approaches (RANS, LES) to engineering problems
- understand common experimental methods applicable to turbulent flows

Course contents

Fundamental phenomena and concepts. Statistical methods. Shear-flow turbulence and the turbulent boundary layer. CFD models and experimental methods for turbulent flow.

The theory of isotropic and homogeneous turbulence.

Examination

- TEN1 - Written examination, 6.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 1.5 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.