



SD2800 Experimental Aerodynamics 6.0 credits

Experimentell aerodynamik

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

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

Establishment

Course syllabus for SD2800 valid from Autumn 2008

Grading scale

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

Education cycle

Second cycle

Main field of study

Language of instruction

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

Intended learning outcomes

The aim with course is that you should learn how to plan, conduct, and process data from wind tunnel tests. You should develop increased understanding of basic physical phenomena

and their influence on the performance of aircraft. Comparisons between experimental and computational results are used to gain experience concerning what type of investigations are most suitable for an experimental approach.

The **overall objectives** of the course are that you should be able to:

- **decide** which type of flight condition that is suitable for wind-tunnel testing,
- **process, interpret** and **compile** data from wind-tunnel testing,
- **compare** and **combine** computational and experimental aerodynamic data,
- **explain** phenomena like stall, hysteresis, separation and influence from boundary layers.

Course contents

The course is based on three projects. Each project is initiated by a general lecture on the topic of each project. This is followed by a group exercise where initial estimates are made and the actual test is planned. Then follows the actual wind tunnel test which is performed in small groups. Finally, a computer lab is performed where the test data is analyzed and processed.

The first project involves an investigation of a wing profile. Measurements are taken of pressure distribution, drag and lift forces. Visualization techniques are used to investigate boundary layer effects and their influence on overall wing profile performance. The second project concerns the measurement of integrated forces on a complete aircraft configuration, in this case the Swedish Air Force jet trainer Saab 105 (SK60). In the final project, the high angle of attack aerodynamics of the supersonic Saab J35 Draken is analyzed.

Specific prerequisites

SD2600 Aircraft Performance Analysis or permission from the coordinator.

Course literature

Barlow, J., Rae, W. H., and Pope, A., Low Speed Wind Tunnel Testing, Third edition, John Wiley and Sons Ltd, 1999.

Examination

- PRO1 - Project, 6.0 credits, grading scale: A, B, C, D, E, FX, 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.

Other requirements for final grade

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.