



FSD3602 Computational Aeroacoustics 3.0 credits

Beräkningsaeroakustik

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

Establishment

Course syllabus for FSD3602 valid from Spring 2019

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

This course is intended to give a working knowledge of computational aeroacoustics and is primarily aimed at PhD students in aerodynamics, fluid mechanics and experimental aeroacoustics. PhD students in other related areas may also apply.

Language of instruction

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

Intended learning outcomes

After completing the course, students should be able to

- Explain and discuss different approaches commonly used to numerically evaluate sound generation and propagation in flows in terms of accuracy and simplification of the underlying physics.
- Apply computational aeroacoustic theory to perform aeroacoustic calculations on benchmark assignments.
- Reflect on and indicate numerical and physical advantages and disadvantages of various levels of simplification and modelling of the underlying equations.
- Evaluate computed aeroacoustic data in terms of its limitations and suggest possible steps that could be taken to improve accuracy and numerical efficiency.

Course contents

The course will contain learning activities on introductory computational aeroacoustics, fundamental acoustics, discretisation of partial differential equations, higher-order accurate methods, aeroacoustic analogies, direct sound computation, linearised acoustic propagation, hybrid aeroacoustic methods and atmospheric propagation. Lectures will be accompanied by assignments where students apply and evaluate the numerical implementation of aeroacoustic theory. These assignments will be presented to all participants and discussed in a seminar at the end of the course.

Disposition

The course consists of five lectures which are preceded by preparatory reading. There are also three assignments where the students perform CAA computation. These form the basis for assessment.

Course literature

The course literature consists of scientific papers and book chapters. Literature will be provided prior to each lecture and students should have read it before attending the lecture.

Equipment

Computer

Examination

- INLA - Assignment, 3.0 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.

To pass the course students must have taken part in all lectures and completed all assignments.

Other requirements for final grade

To pass the course students are required to actively participate during lectures and discussions. Furthermore, students must satisfactorily complete the course assignments and actively participate in the course seminar, where they will demonstrate that they have met the learning objectives.

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.