



# SD2191 Vehicle Acoustic and Vibrations 6.0 credits

Fordonsakustik och vibrationer

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

The course syllabus is valid from Spring 2022 according to the school principal's decision: S-2022-0529 Decision date: 2022-02-24

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

## Specific prerequisites

Basic courses in mathematics, mechanics and noise control.

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 goals of the course, for the student, are:

- To understand the basic principles of the design aspects for NVH in cars.
- To know the most dominant sources of noise and vibration in cars, the dominant transmission paths including their relative importance at different driving conditions.
- To understand the critical design issues and their relations for NVH, in particular the aspects of objective and subjective design.
- To get a basic knowledge in the process driving concurrent design, in particular in view of vehicle acoustics.
- To get an overview of state-of-the art in Computer Aided Engineering applied to NVH together with examples of NVH issues treated by CAE and to understand the limitations of the models used.
- To get a basic understanding of the difference between objective and subjective (human response) design criteria and how they influence the design process.
- To get an overview of modern design solutions in NVH, the materials used and their principle function, together with the current trends in the development of new solutions.

## Course contents

Review of current methods for the noise, vibration and harshness (NVH) design of passenger vehicles. Load cases, analysis types and CAE (Computer Aided Engineering) optimization processes. NVH analysis with relationship to other vehicle function CAE processes. Modeling, analysis procedures and accuracy of results in “virtual” vehicle development process. Variability in actual vehicle structures. Materials, modeling and design, for NVH treatment. Sound quality. Source identification.

## Examination

- INL1 - Assignments, 4.5 credits, grading scale: P, F
- TEN1 - Examination, 1.5 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.

## 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.