AF2901 Road- and Railway Track Engineering 7.5 credits

Väg- och banteknik

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

Establishment

Course syllabus for AF2901 valid from Autumn 2021

Grading scale

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

Education cycle

Second cycle

Main field of study

The Built Environment

Specific prerequisites

Documented knowledge in Soil Mechanics and Foundation Engineering and Structural Engineering equivalent to at least 15 ECTS corresponding to the content in courses AF1601 and AF2003.

Eng B/6 according to the Swedish upper secondary school system.

Language of instruction

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

Intended learning outcomes

When the course is done, those students taking part shall be able to:

- Understand the link between road classification and structural differences;
- Describe the factors influencing geometric roads and railways design;
- Explain mechanisms and factors influencing long term structural performance of roads and railways;
- Make a structural design of a road and evaluate the most important assumptions in the procedure;
- Describe the dominant material properties used in building and maintenance of roads;
- Understand the suitable test methods for the material characterization and explain the connection to performance related properties;
- Describe the principles of non-destructive evaluation techniques for design and maintenance of roads;
- Understand the concept of a life cycle perspective in road- and railway engineering;
- Understand the importance of mechanics based design;
- Use mechanics based pavement design procedures;
- Material characterization (binder, aggregates & mixtures) including intro to visualization;
- Understand existing laboratory equipment for characterization of ballast material & asphalt concrete;
- Analyze and utilize results from experimental laboratory test.

Course contents

In this introduction course, students will learn the basics of geometrical and mechanical design of road and railways. By participating in course, the students will be exposed to the various design steps and will be able to relate long-term environmental and mechanical mechanisms to the choice of materials, the appropriate test methods and design methods. The course focuses on developing a basic understanding of why fundamental mechanical understanding of the structures allow for a sustainable road and railway track design. The course combines lectures, with on-line course material and hands-on exercises.

Examination

- ÖVN1 - Exercises, 3.0 credits, grading scale: P, F
- TEN1 - Examination, 4.5 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.

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

The total credits for the course are separated into credits for passing the exam and passing the exercises. No bonus point will be given through the exercises. The exam, however, will contain a bonus question related to testing a broader understanding of the subject.

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.