



# AF2905 Road- and Railway Track Engineering, advanced course 7.5 credits

Väg- och Banteknik, fortsättningskurs

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

## Establishment

The official course syllabus is valid from the fall semester 2023 in accordance with the decision by the Head of the ITM School: A-2022-2495. Date of decision: 13/10/2022

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

The Built Environment

## Specific prerequisites

At least 7,5 ECTS documented knowledge in the fields of path- and railway technology equivalent to course AF2901.

## Language of instruction

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

## Intended learning outcomes

On completion of the course, the student should be able to:

- Describe material properties and their effect on the components of the railway system.
- Explain the construction process and the environmental impact of the operation of various highway and railway infrastructures.
- Explain planning and maintenance questions including LCC and LCA.
- Develop and apply LCA models about the road design process.
- Optimise the geometric road design with digital tools considering the sustainability.
- Evaluate and compare the behaviour of various road infrastructures with the Finite Elements method.

## Course contents

In this course, the students will learn advanced concepts about the path and railway system such as:

- Track forces and the influence of the track on the traffic.
- Track design for efficient railway traffic.
- Work processes connected to the components of the railway and their material properties.
- Building processes for design and maintenance of various highways and railways.
- Optimisation of geometric road design.
- Economics around LCC method and calculation.
- Environment and sustainability with LCA method and calculation.
- Assessment of the behaviour of road infrastructure with Finite Elements simulations.
- Research-related questions around highway and railway technology.

## Examination

- TEN1 - Written exam, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- ÖVN1 - Exercises, 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.

## **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.