



# AF2904 Advanced Pavement Engineering Analysis and Design

## 6.0 credits

Advanced Pavement Engineering Analysis and Design

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

### Establishment

Course syllabus for AF2904 valid from Autumn 2010

### Grading scale

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

### Education cycle

Second cycle

### Main field of study

### Specific prerequisites

At least 120 credits academic studies in Engineering, Science, Economics or Planning and documented proficiency in English B or equivalent (TOEFL, IELTS e.g.).

AF2901 Road and Railway Track Engineering, or similar

AF2903 Road Construction and Maintenance, or similar

# Language of instruction

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

## Intended learning outcomes

Upon completion of this course the student will be able to:

- Perform detailed analysis of stresses and strains in flexible pavements
- Perform mechanistic-empirical analysis and design
- Perform layer modulus back-calculation procedures
- Apply basic concepts of viscoelasticity and fracture mechanics to the optimization of flexible pavement cracking resistance

## Course contents

- Review of distribution of stresses and strains in layered pavement systems
- Layered elastic analysis and layer modulus back-calculation
- Rutting and fatigue cracking performance criteria for flexible pavements
- Low temperature cracking in flexible pavements
- Traffic and load spectra
- Environmental effects on pavement performance
- Mechanistic-empirical pavement design procedures
- Overview of the theory of viscoelasticity
- HMA fracture mechanics and application to top-down, bottom-up, and low temperature cracking in pavements

## Disposition

Including part of AF2019

## Examination

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

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

## **Other requirements for final grade**

Passed written exam (4,5 ECTS credits)

Passed exercises (3 ECTS credits)

## **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.