

SYLLABUS

Road and Railway Engineering 7.5 credits G7001B

Vägar och järnvägar

Course syllabus admitted: Autumn 2012 Sp 1 - Spring 2014 Sp 3

**DECISION DATE
2012-03-14**

Road and Railway Engineering 7.5 credits G7001B

Vägar och järnvägar

Second cycle, G7001B

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	G U 3 4 5	Väg- och vattenbyggnad	Civil Engineering

Entry requirements

Selection

The selection is based on 30-285 credits

Examiner

Sven Knutsson

Course Aim

The aim of the course is to prepare the student to work within the road- and railway industry from an engineering perspective.

Specific goals:

After the course the student should be able to:

Describe:

- The road and railway planning process
- The road transportation system
- The railway transportation system

Account for:

- Routine maintenance operation
- General safety procedures for earthworks and on roads and railways
- Pavement, railway and unbound materials
- Pavement evaluation and rehabilitation
- Frost action mitigation
- Life-cycle costing

Explain:

- Structural principles of road and railway design
- Theoretical background on mechanistic-empirical design methods
- Stress-strain modeling from static and dynamic loading
- Frost action effects on road and railway
- Railway embankment design

Apply:

- Flexible and rigid pavement design procedures
- Evaluation of FWD, DCP and static plate load test.

Contents

A historical review of the road and railway development.

Overview of the road and railway system and the working processes connected to the different stages of the construction life-cycle.

The subgrade influence of the superstructure design.

Frost action effect and prediction on road and railway structures.

Structural design of road and railway's focusing on the embankment.

Superstructure materials, e.g. unbound aggregates, pavement materials and rails.

Design procedures in superstructure design, e.g. AASHTO and international examples on stress-strain approaches on design.

Maintenance and rehabilitation of infrastructure.

Road and railway specific field test methods such as FWD, DCP and static plate load test.

National perspective on Best Practice

Life-cycle costing aspects

Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

The course consists of lectures, assignments and project works. Optional a study visit will be arranged if an ongoing construction site in the neighborhood has the opportunity to host the course.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided. Written tests.

Overlap

The course G7001B is equal to ABG100

1000

Literature. Valid from Autumn 2012 Sp 1

Brockenbrough, R. L. 2009. Highway Engineering Handbook. McGraw-Hill, New York. ISBN 9781615835959.

Bonnett, C. F. 2005. Practical Railway Engineering. Imperial College Press. ISBN 9781860946851.

The literature is available as e-books on the LTU library for the students. Additional material will be handed out on Fronter.

Course offered by

Department of Civil, Environmental and Natural Resources Engineering

Items/credits

Number	Type	Credits	Grade
0002	Assignments	2.2	U G#
0004	Written exam	4.5	G U 3 4 5
0005	Project work	0.8	U G#

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

Last revised

by Eva Gunneriusson 2012-03-14

Syllabus established

The plan is established by the Department of Civil and Environmental Engineering 2007-01-31 and is valid from H07.