

SYLLABUS

Design of aluminium and stainless steel structures 5 credits S7009B

Dimensionering av aluminium och rostfria stålkonstruktioner

Course syllabus admitted: Autumn 2014 Sp 1 - Autumn 2015 Sp 2

**DECISION DATE
2014-02-10**

Design of aluminium and stainless steel structures 5 credits S7009B

Dimensionering av aluminium och rostfria stålkonstruktioner

Second cycle, S7009B

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	U G#	Stålbyggnad	Building Technology

Main field of study

Civil Engineering

Entry requirements

S7004B Steel Structures or courses necessary for admission at SUSCOS program

Selection

The selection is based on 30-285 credits

Examiner

Milan Veljkovic

Course Aim

The course will provide students with basic information on material characteristics, behaviour and design of structures made of aluminium alloys and stainless steels.

The first part of the course will deal with structures made of aluminium alloys. Selection of suitable materials for given structure, material properties and application examples will be provided according to Eurocode 9 (Design of aluminium structures).

Heat affected zone softening (HAZ) will be shown and corresponding effect on design. Finally, advanced models beyond elastic limit will be demonstrated and design will be provided.

The second part of the course will be devoted to structures made of stainless steels. A survey of general stainless steel materials and those suitable for civil engineering structures will be provided. Design background and numerical examples will be according Eurocode 3 (General rules Supplementary rules for stainless steels) and recommendations of Euro Inox.

Special attention will be given to erection and installation with respect to need of specific treatment, handling and storage of elements and structures.

The course will cover design requirements based on ultimate and serviceability limit states, including design of various types of connections.

Contents

The course consists of two distinct parts:

- structures made and designed of aluminium and specific topics such material characteristics and welding including effects of HAZ softening, design of aluminium bolted connections, design beyond the elastic limit;
- structures made and designed of stainless steel and specific topics such material characteristics and the connection design, erection and installation.

Several useful software tools for easy application of these models will be presented.

Students should be able to analyse and understand the behaviour of aluminium and stainless steel elements and structures. This will be shown by numerical elements such as beams and columns and complex structures.

The students practise the design methods according to European standards to be able to perform structural design.

Approved home assignments will necessary to obtained pass in the course.

Realization

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

Lectures, numerical examples and consultations.

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.

Approved home assignments are required to obtained pass at the course.

Grading: Passed or not passed.

Literature. Valid from Autumn 2014 Sp 1

Eurocode 9 (EN 1999: Design of aluminium structures. Part 1 to Part 5)

Mazzolani F. M.: Aluminium alloy structures, E & FN SPON, London, 1995.

Valtinat G.: Aluminium im Konstruktivem Ingenierbau, Ernst & Sohn, Berlin, 2003.

TALAT, URL: www.eaa.net/eea/education/TALAT

Eurocode 3 (EN 1993-1-4: Design of steel structures – Part 1-4: General rules - Supplementary rules for stainless steels)

Euro-Inox: <http://www.euro-inox.org/>

Design Manual for Structural Stainless Steel. Euro Inox and The Steel Construction Institute, 2006

Course offered by

Department of Civil, Environmental and Natural Resources Engineering

Items/credits

No items/credits available

Syllabus established

by Eva Gunneriusson 2014-02-10