Timber and Steel Structures

Programme course

8 credits

Trä- och stålkonstruktion

TNBI92

Valid from: 2017 Spring semester

Determined by
Board of Studies for Mechanical Engineering and Design

Date determined
2017-01-25

Offered for the last time
Autumn semester 2020

Replaced by
TNBJ21 och TNBJ29

Main field of study
Civil Engineering

Course level
First cycle

Advancement level
G1X

Course offered for
- Civil Engineering, B Sc in Engineering

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Structural Mechanics and Strength of Materials. Building Technology basic course. CAD Technology 2D.

Intended learning outcomes
The course intends to give basic knowledge of timber and steel structures.

- The student should be able to describe properties and applications for the most common building construction materials
- Design of basic structures should be performed by using tables, formulas and handbooks. The calculations should be easy to follow and understand
- Calculations should be implemented in ultimate limit state and in serviceability limit state
- Technical terms, symbols and conventions should be used adequately
- Knowledge should be used integrated in analysis and solution to basic structures. Calculations should be estimated with reasonable approximations
- The student should have an overview of function, action and validity of composed structures made up of different building units
- The student should act in order to find creative and well working solutions to project assigments
- Project assigments should be presented adequately. Drawings should be implemented in CAD

Course content
Timber design: Wood as a building construction material. Determination of capacity subject to bending moment, shear force and normal force. Joint design with nails, screws and bolts. Calculation of deflection. Design of various types of connection. Bracing of horizontal forces. Steel design: Steel as a building material. Calculations in ultimate limit state: Design subject to bending moment, shear force and normal force and joint design with bolts and welds. Calculations in serviceability limit state: Design subject to deformation. Constructional details and instructions. Rust and fire protection.

Teaching and working methods
The lectures contain theoretical parts, solutions to typical problems and preparation of project assigments. A field trip to a suitable object.
The course runs over the entire autumn semester.

Examination

UPG2	Hand-in exercises	2 credits	U, G
TEN1	Written examination	6 credits	U, 3, 4, 5

Grades
Four-grade scale, LiU, U, 3, 4, 5

Department
Institutionen för teknik och naturvetenskap

Director of Studies or equivalent
Dag Haugum

Examiner
Osama Hassan

Course website and other links

Education components
Preliminary scheduled hours: 64 h
Recommended self-study hours: 149 h

Course literature

Additional literature

Books

Börje och Carina Rehnström, *Byggkonstruktion enligt eurokoderna*
Börje och Carina Rehnström, *Stålkonstruktioner enligt eurokoderna*
Börje och Carina Rehnström, *Träkonstruktioner enligt eurokoderna*
Johannesson-Vretblad, (2011) *Byggformler och tabeller*

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.