



Course syllabus

Byggnadskonstruktion Structural Design

VSMF10, 9 credits, G2 (First Cycle)

Valid for: 2023/24

Faculty: Faculty of Engineering, LTH

Decided by: PLED V

Date of Decision: 2023-03-21

General Information

Compulsory for: IBYA2

Language of instruction: The course will be given in Swedish

Aim

The aim of the course is to give knowledge about the design of simple structural elements of wood, steel and reinforced concrete as well as basic knowledge about structural stability and structural joints.

The other part of the course consists of study visits and/or project lectures and aims to clarify the various parts and roles in the construction process.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- Be able to explain and use the partial coefficient method for structural safety.
- Be able to explain how the unique properties of construction materials are expressed in design rules.
- Be able to analyse how loads are carried down to the foundation via the structural elements in a building.
- Be able to explain various principles for structural stability.
- Be able to explain the function of simple structural joints.
- Be able to explain fire protection of structures on a fundamental level.

Competences and skills

For a passing grade the student must

- Be able to determine design load including load combinations.
- Be able to design simple elements of wood/glulam, steel and reinforced concrete subjected to tension, compression, bending moment and shear, by itself or in combination.
- Be able to design for limitations in deformations.
- Be able to design simple systems for structural stability.
- Be able to present a structural design project in a report, for wood/glulam, steel and reinforced concrete.

Judgement and approach

For a passing grade the student must

- Show ability to make suitable assumptions and judge the influence of them.
- Be able to assess the reasonableness in an obtained result.
- Show an approach that recognises that the design of a structure is affected by other aspects than structural strength.

Contents

The course includes:

- Basic principles for design based on the partial coefficient method and the determination of the most dangerous load combination.
- Design and verification are based on code requirements for wood, steel and reinforced concrete.
- Principles for the design of simple structural systems and stabilization of structural units.
- Principles for design of simple structural joints.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)

Assessment: Hand-in assignments, afu and written examination.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Parts

Code: 0111. **Name:** Structural Design.

Credits: 6. **Grading scale:** TH. **Assessment:** Written examination.

Code: 0211. **Name:** Work Related Training.

Credits: 0. **Grading scale:** UG. **Assessment:** Compulsory attendance. These hours are not included in the time plan.

Code: 0311. **Name:** Hand-in Assignments.

Credits: 3. **Grading scale:** UG. **Assessment:** Approved hand-in assignments. Grade will influence final grade on course.

Admission

Assumed prior knowledge: FME602 Structural Mechanics or VSMA20 Structural Mechanics.

The number of participants is limited to: No

The course overlaps following course/s: VBK013, VSM611, VBKF15

Reading list

- Isaksson, T., Mårtensson, A., Thelandersson, S., Fruwald-Hansson, E., Fröderberg, M.: Byggekonstruktion. Studentlitteratur, 2020, ISBN:

9789144138558. 4:th edition.

- Isaksson, T, Mårtensson, A.: Byggkonstruktion, Regel- och formelsamling. Studentlitteratur, 2020, ISBN: 9789144138565. 4:th edition.

Contact and other information

Course coordinator: Universitetslektor Susanne Heyden,
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Course homepage: <http://www.byggmek.lth.se/utbildning/kurser/>