Faculty of Technology and Science
Construction Engineering

Syllabus

Course Approval
The syllabus was approved by the Faculty Board of Technology and Science on 21 April 2008, and is valid from the Spring semester of 2008 at Karlstad University.

Course Code: BYGB14
Engineering Design: Steel Structures, 7.5 ECTS Credits
(Stålkonstruktion, 7.5 Swedish credit points)
Degree Level: Bachelor
Progression Level: B

Language of Instruction
Swedish

Prerequisites
Engineering design project 7.5 ECTS cr or equivalent

Major Field of Study
Building Technology

Learning Outcomes

The course is an elective in the second year of the Building and construction engineering programme. It is a design course in which students learn to design simple steel structures. The aim of the course is that students acquire skills in calculating statically indeterminate constructions, basic knowledge of structural elements of steel, and skills in designing steel structures.

For a Pass grade, students should be able to:
- use the elementary case method, displacement method and table formula for calculating load on statically indeterminate beams,
- use maximum moment diagram and lines of action,
- design beams and columns with regard to tensile and compressive force capacity,
- design beams with regard to bending moment and shear force capacity,
- design simple weld joints,
- design simple screw joints.

Students should also be able to plan, carry out and present the design of a building in accordance with codes and standard practice.

For a grade of Distinction (4 or 5), students should, in addition to the requirements above, be able to:
- use the dispslacement method with reagard to calculating load on framework,
- design constructions with regard to combination of bending moment and normal force,
- design beams with regard to skewed bending,
- control beams with regard to concentrated load,
- design combined weld and skrew joints,

- demonstrate understanding of the field by knowing what calculations and controls are required in the design of a construction and demonstrate skills in applying the knowledge.

Content and Form of Instruction

The course consists of:
- calculating load on statically indeterminate constructions,
- free action, maximum moment diagam, lines of action
- the properties of steel, rust and fire protection
- tensile and compressive force
- bending moment capacity
- axial force and bending moment
- skewed bending
- shear force capacity
- concentrated load and Web stiffeners
- deformation
- weld joints
- screw joints
- combined weld and screw joints
- information on framework details and presentation and controlling steel structures.

Instruction is in the form of lectures and calculation exercises. One design task is mandatory.

Reading List

See separate document.

Examination

Examination for the Pass grade (3) is continuous throughout the course. Examination is in the form of a writtten assignments and a written design task. For a grade of Distinction (4 or 5) students sit a written exam at the end of the course. Students who have failed to earn a Pass grade have a re-sit opportunity at the end of the course.

Grades

One of the grades 5 (Distinction), 4 (Some Distinction), 3 Pass , or Fail (U), is awarded in the examination of the course.

Quality Assurance

Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course assessment is based on student views and experiences as reported in written course evaluations and/or group discussions. Students will be informed of the result of the evaluation and of the measures to be taken.

Course Certificate

A course certificate will be provided upon request.

Additional Information

Students who enrolled before 1 July 2007 will complete their studies in accordance with the requirements of the earlier admission. Upon completion students may request degree and course certificates to be issued under the current ordinance if they meet its requirements.

Examination based on this syllabus may be completed up to one year after the syllabus is replaced. Two examination opportunities are provided during the first academic year in which the course is not offered, and one in the second year.

The local regulations for studies at the Bachelor's and Master's levels at Karlstad University, ref. C2007/368, stipulate the obligations and rights of students and staff.

Group projects require students to be present beyond scheduled hours.

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