Linnæus University

Jnr: 2018/2182-3.1.2.2

Course syllabus

Faculty of Technology
Department of Building Technology

1BY012 Byggnadsmekanik, 7,5 högskolepoäng
Structural Mechanics, 7.5 credits

Main field of study
Civil Engineering

Subject Group
Building Technology

Level of classification
First Level

Progression
G1F

Date of Ratification
Approved 2009-12-15
Revised 2018-06-21 by Faculty of Technology. Change of prerequisites.
The course syllabus is valid from autumn semester 2019

Prerequisites
General entry requirements and Mathematics 3c, Physics 2 or Mathematics D, Physics B (Field-specific entry requirements 8/A8). Mechanics (1FY804) 7,5 credits or at least 37.5 credits in the field of Civil Engineering Programme, Building and Construction, of which at least 7.5 credits Mathematics (Basic Mathematics for engineers (1MA131) 7,5 credits, Calculus for engineers (1MA132) 7,5 credits, Linear algebra for engineers (1MA133) 7,5 credits) or similar.

Objectives
After completing the course the student is expected to be able to:

• define and explain concepts within Structural Mechanics/Solid Mechanics• identify suitable models and be aware of different assumptions made in connection to analyses of mechanical structures• apply concepts and principles within Structural Mechanics/Solid Mechanics in order to calculate and present solutions to structural mechanics problems• present results from laboratory work and assignments in written reports in a way that is generally expected from engineers

Content
The course comprises the following elements:

- the concepts of stress and strain, including general stress states, principal stresses and measures of effective stresses
- section forces in beams, bars and axes exposed to different types of loading
- analyses of statically determinate and indeterminate beams
- analyses of statically determinate trusses
- stresses in beams exposed to bending and normal forces and axes exposed to torque
- the differential equation of the deflection curve describing beam deformation
- deformation of bars
- second order effects and instability
- linear elastic and elastic ideal-plastic material assumptions
- elastic and plastic moment capacity for beam sections.

Type of Instruction
The teaching consists of lectures, laboratory work and exercises. Participation in one laboratory task/project is compulsory. An account of the work and the results shall be given in a written report following engineering standards.

Examination
The course is assessed with the grades U, 3, 4 or 5.
The examination consists of two parts, the report of the laboratory work and a written examination. The report of the laboratory work (1 credit) is assessed as failed passed. The written examination (6,5 credits) is assessed with the grades U, 3, 4 or 5.

Both parts must be approved before the course is passed. The final grade is then given by the grade of the written examination.

Course Evaluation
During the course or in close connection to the course, a course evaluation is to be carried out. The result and analysis of the course evaluation are to be communicated to the students who have taken the course and to the students who are to participate in the course the next time it is offered. The course evaluation is carried out anonymously. The compiled report will be filed at the Faculty.

Credit Overlap
The course cannot be included in a degree along with the following courses of which the content fully, or partly, corresponds to the content of this course: 1MT003

Required Reading and Additional Study Material
Required reading
S. Heyden, O. Dahlblom, A. Olsson, G. Sandberg, *Introduktion till Strukturmekaniken*, Studentlitteratur, latest edition. 240 of 307 pages.