LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Integrerad design: Konstruktion - Arkitektur
Integrated Design: Structural Design - Architectural Design

VSMN15, 7,5 credits, A (Second Cycle)

Valid for: 2023/24
Faculty: Faculty of Engineering, LTH
Decided by: PLED V
Date of Decision: 2023-03-21

General Information

Elective for: V4-ko
Language of instruction: The course will be given in English on demand

Aim

The aim of the course is to establish a common frame of concepts relating to structures, optimisation and architectural expressions, in the interaction between engineers and architects in the final part of their studies.

Further, the aim of the course is to show that structural mechanics concepts and architectural expressions are related by our way of understanding, one by a natural science organization, the other by intuitive understanding.

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- Be able to explain the general behaviour of various types of structures.
- Be able to develop the relation between structural design and architecture.
- Be able to take an active part in an architect - structural engineer discussion about expression and function in a building.

Competences and skills
For a passing grade the student must

For architectural students:

- Be able to develop ideas about form into structures in a dialogue between architect and structural engineer.

For engineering students:

- Be able to formulate and analyse structures, from conceptual sketches to complete projects.
- Be able to develop structural mechanics principles in relation to form issues.
- Be able to use advanced computational computer codes in conceptual projects.

Judgement and approach
For a passing grade the student must

- Have insight into that a fruitful cooperation between architect and structural engineer is obtained by a dialogue, and not by sequential work.
- Be able to take an active part in a cooperation between architect and engineer.
- Present a proposal for a structure and describe how the proposal is a consequence of cooperation.

Contents

The course starts with a series of lectures and discussions about structural concepts and a general description of the relation between structural mechanics/engineering and architecture. Further, structural elements are discussed, as well as how these contribute to give different expressions and how the structural design concepts vary with the expression.

The course is organized as a project course where both architectural students and engineering students contribute with their own future field of expertise. The projects are defined so that spatial qualities meet structural challenges. The literature constitutes a foundation for discussion in seminars concerning the interfacing and negotiation of spatial expression and structural design.

Examination details

Grading scale: UG - (U,G) - (Fail, Pass)
Assessment: Assesment of project work. In the final project, engineering and architectural students work together in close cooperation. The project is presented at a seminar. To pass, the student must have participated in 75% of the teaching activities and the presentation must consist of a qualitative discussion that leads to a project proposal.

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.

Admission

Admission requirements:

- VSMN30 The Finite Element Method - Structural Analysis: part Design Assignments 2.5 hp OR VSMF05 Engineering Modelling: Analysis of Structures OR FHLF01 Finite Element Method OR FHLF10 Finite Element Method and Introduction to Strength of Materials OR FHLF20 Finite Element Method

The number of participants is limited to: No
The course overlaps following course/s: AFO280, AAHN10

Reading list

- Frei Otto and Bodo Rasch: Finding Form; Towards an Architecture of the Minimal. Axel Menges, 1996, ISBN: 3-930698-66-8. Non-compulsory.
- Tony Robbin: Engineering a New Architecture. Yale University Press, 1996, ISBN: 0-300-06116-1. Non-compulsory.
- Olga Popovic Larsen : Conceptual Structural Design, Bridging the gap between architects and engineers. ICE Publishing, 2016, ISBN: 9780727761101. Recommended.
- Angus J. Macdonald: Structure and architecture. Routledge, 2018, ISBN: 9781138629240. Non-compulsory.

Contact and other information

Course coordinator: Professor Erik Serrano, erik.serrano@construction.lth.se
Course homepage: http://www.byggmek.lth.se
Further information: The course is given by the Divisions of Applied Aesthetics and Structural Mechanics. The course is given in parallel with the course for A: AAHN10