Course syllabus

CAD- och BIM-baserad byggprojektering
CAD and BIM Applications in Construction

VBEF50, 7,5 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

Elective for: V4
Language of instruction: The course will be given in Swedish

Aim

The purpose of the course is for the course participant to attain basic knowledge and understanding of virtual design and construction with respect to 2D-drawing and 3D-modelling with CAD- and BIM-applications. The course supports an explorative learning process in which the course participants learn how to apply CAD- and BIM-based design and construction in a realistic context. The software systems used in the course are commonly applied in the industry.

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- achieve a general understanding of some basic concepts and possible CAD- and BIM-applications for the design and construction of building projects.
- understand the fundamentals of a drawing and how to scale objects.
- understand the fundamental structure and composition of parametric 3D-models e.g. with respect to objects, codes and classification, layers/families, detail levels etc.

- have an overall understanding of the design phase of the construction process, its organisation and the roles and responsibilities of the various actors involved.

Competences and skills
For a passing grade the student must

- Be able to manage drawings in 2 dimensions, scales, dimensioning, text and to plot drawings
- conduct basic 3D-modelling operations, critically review and verify the quality and information of a 3D-model.
- render suitable 3D-visualisations and animations for various needs.
- use a 3D-model for analyses and simulations of applications depending on the need of various interest groups within structural engineering, building construction and house building technology

Judgement and approach
For a passing grade the student must

- be able to identify, critically review and describe some basic pros and cons that are related to CAD- and BIM-based design and construction.
- achieve an understanding and constructive attitude about the basic organisational and technical demands that come with CAD- and BIM-based design and construction.
- understand the importance of the design process and its impact on the construction process and the life cycle aspects of operation and maintenance of the finished building product.

Contents

The course rests upon assignments in which a building client has assigned the course participants to act in the role of BIM-consultants.
The course is designed as an applied course in which the course participants are expected to test and explore the introduced CAD- and BIM-tools in order to carry out the analyses, simulations and visualisations that are included in the case assignment of the course.
The course includes separate assignments that deal with 2D-drawings, 3D-modelling including model verification, visualization and drawings. Each assignment is reported in a written report. Written feedback for all assignments is provided to all course participants. There are also teaching events that consider various applications within structural engineering, building construction and building technology. The course ends with a concluding and comprehensive project assignment, whith a topic related to the students' interest in one of the areas buildnings. Teachers from different divisions with research-/teaching interest that matches the assigned projects can act as mentors. The results of the project assignment are reported in a written report and are presented orally at a mandatory seminar by the end of the course. Written feedback for the project assignments is provided to all course participants.

Examination details

Grading scale: UG - (U,G) - (Fail, Pass)
Assessment: Grading scale: Pass/Fail Assessment: The course participants are assessed on basis of their written presentation of the assignments, an oral and written presentation of the project assignment. Mandatory participation at the presentation seminar. For a pass grade, pass grade is needed for every part (assignments, written project report, oral project presentation, participation in presentation seminar).

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:

- VBFA01 Building Technology and Building Services
- VBK013 Structural Engineering, Basic Course or VBKF15 Structural Engineering

Assumed prior knowledge: VBKF01 Structural Engineering - Building Systems or VBFN05 Energy, Air Movements and Moisture at Rebuilding and Administration
The number of participants is limited to: 30
Selection: Completed university credits within the programme. Priority is given to students enrolled on programmes that include the course in their curriculum.
The course overlaps following course/s: VBKF20, TFRG25, VBKN20, VBKF05

Reading list

- Course material (program manuals, articles, excercise instructions etc) is provided on the course web page or in other ways.

Contact and other information

Teacher: Francesca Vergani, francesca.vergani@construction.lth.se
Course administrator: Kolbrun Arnadottir, kolbrun.arnadottir@construction.lth.se
Course coordinator: Carlos Martinez, carlos.martinez@construction.lth.se
Course homepage: http://www.bekon.lth.se/utbildning/grundutbildning/
Further information: Course homepage at Canvas. All registered students have access to the course homepage. Short information available at www.bekon.lth.se/utbildning.