Course syllabus

Modellbaserad projektering
Model Based Design

VBEF45, 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: IBYA3, IBYI3, IBYV3
Language of instruction: The course will be given in Swedish

Aim

The purpose of the course is to provide knowledge of and skills in digital management of a project with a focus on BIM techniques and house construction. The course demonstrate how to create a BIM (Building Information Model) model of a house as an information carrier during the entire construction process with the help of a modern object-oriented 3D modeling program. Through the ongoing paradigm shift in the construction industry from a document to a database-based information system, how to handle and develop graphic, written and other information to make construction more efficient is thaught. This includes changes in working methods, new and changing work roles, new areas of responsibility, a new, more efficient construction process. The theory should provide insights into how the architect's object models are organized to support building information modeling (BIM).

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- Be able to build an object-based computer model of a house building on several floors and understand how the building's representation in the computer medium is structured.
- Be able to administer an object-based computer model with regard to standard elements, library parts, libraries, warehouses etc.

- Be familiar with the functionality and area of use of a modern 3D modeling BIM program in the design phase.
- Be able to describe and understand modern integrated ICT technology - its handling and construction in a BIM environment.
- Be oriented in how stand-alone programs or additional applications can generate data from BIM models for analysis and decision support in later project stages.

Competences and skills
For a passing grade the student must

- Demonstrate how to build an object-based computer model of a multi-storey house building.
- Use a modern 3D modeling BIM program and understand the theory behind a building information model's application possibilities in the various stages of the construction process.
- Use standalone programs or additional applications to generate data from a BIM models for analysis and decision support in procurement, production or management stages.

Judgement and approach
For a passing grade the student must

- Understand integrated ICT management (Information and Communication Technology) with the support of BIM as a tool for the entire construction and management process, from program stage to management
- Understand the advanced principles of BIM in the construction process
- Be able to interpret a BIM manual
- Be able to use different tools for BIM coordination.

Contents
- Practical training in 3D modeling techniques to support model-based design and BIM.
- Theoretical overview of ICT, CAD and BIM development in the construction industry. Special attention is paid to object orientation, parameters, interoperability, information transfer methods, databases, model servers / submodels and technical solutions that have made today's BIM applications possible.
- Process-related BIM theory regarding working methods, work roles, areas of responsibility, standardization / classification, connection to industrialized construction processes.
- Theoretical review of application areas such as quantity, purchasing, logistics, simulation, management, collision control, production preparation and control.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)
Assessment: The course participants are assessed on the basis of individually reported exercises and approved theory quiz with grade scale F, P. Final grade (TH) with subsections graded with both TH grade and UG grade. Mandatory attendance at lectures.

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:

• VBEA30 Communication and Computer Tools

Assumed prior knowledge: VBEA30
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 might be cancelled: If the number of applicants is less than 10.
The course overlaps following course/s: AFO680, MMT656

Reading list

• Course material (program manuals, articles, excercise instructions etc) is provided on the course web page or in other ways. On the course page on Canvas, there will be links to external information sources on the web. The course requires extensive self-study of program manuals and tutorials from the web to be able to solve tasks according to the problem-based learning model. Program manuals and tutorials can be found independently.

Contact and other information

Course coordinator: Margherita Lisco, margherita.lisco@construction.lth.se
Course administrator: Kolbrun Arnadottir, kolbrun.arnadottir@construction.lth.se
Course homepage: http://www.bekon.lth.se/utbildning/grundutbildning/
Further information: Assignments, other instructions and information will be on Canvas.