

Course guide

310712 - 310712 - Workshop 2: Concept Modelling (BIM)

Last modified: 06/06/2024

Unit in charge: Barcelona School of Building Construction
Teaching unit: 752 - RA - Departamento de Representación Arquitectónica.
753 - TA - Department of Architectural Technology.
749 - MAT - Department of Mathematics.

Degree: BACHELOR'S DEGREE IN ARCHITECTURAL TECHNOLOGY AND BUILDING CONSTRUCTION (Syllabus 2019).
(Compulsory subject).

Academic year: 2024 **ECTS Credits:** 3.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: Gustavo de Gispert Irigoyen

Others: Eloi Coloma Picó
Jordi Xiques Triquell

REQUIREMENTS

Have a personal computer to install Autodesk Revit and Navisworks programs.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

3. FB-3 Ability to apply the systems of spatial representation, the development of the sketch, the proportionality, the language and the techniques of the graphical representation of the constructive elements and processes.
4. FE-2 Knowledge of the infographic and cartographic procedures and methods in the construction field.
5. FE-13 Ability to apply the technical regulation to the construction process, and generate documents of technical specification in the constructive procedures and methods of buildings.
6. FE-4 Knowledge of the materials and traditional or prefabricated construction systems used in construction, their varieties and physical and mechanical features which define them.

Transversal:

1. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.
2. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.

TEACHING METHODOLOGY

Inverted classroom. A theoretical concept will be published on the Atenea Campus that will be developed in the form of classroom practice. The teacher will give guidelines for the practice and will guide the student in achieving the objectives of each session. The convenience of the student studying and practicing the activity before attending class will be encouraged so that they can use it for questions or to improve the objectives of each activity.

LEARNING OBJECTIVES OF THE SUBJECT

- Build virtual models using tools that can be integrated into a BIM process.
- Learn about management tools for the building project using the BIM methodology.
- Obtain optimal graphic results of a building project using BIM methodology.
- Analyze constructive solutions and the use of materials from a building project created with BIM methodology.
- Obtain quantitative results of a building project using BIM methodology.

STUDY LOAD

Type	Hours	Percentage
Hours small group	30,0	40.00
Self study	45,0	60.00

Total learning time: 75 h

CONTENTS

Virtual modeling associated with information

Description:

The Revit program will be used to introduce the student to object-based modeling.

Related activities:

A00
A01
A02
A03

Full-or-part-time: 26h

Practical classes: 26h

title english

Description:

The Navisworks program will be used to analyze existing projects and be able to extract information and propose modifications efficiently.

Related activities:

A04

Full-or-part-time: 4h

Practical classes: 4h

ACTIVITIES

A00 - Work environment

Description:

We introduce Revit as a BIM tool for project development. We will identify the composition of the design environment according to different possibilities of graphic consulting of models.

Specific objectives:

- Open a project modeled in Revit.
- Identify the different sections of the work environment.
- Visualize the model in different ways and know the possibilities of the different views.
- Know the types of work files.

Material:

Guided guide and support websites.

Delivery:

This activity has no deliveries or evaluation but counts as class attendance.

Full-or-part-time: 2h

Practical classes: 2h

A01 - Apartment for two.

Description:

The drawing of housing sketches and their subsequent passage to a dimensioned plan is an exercise that will be carried out when developing many of the skills that a Technical Architect acquires with the degree. This first exercise is not intended to study the construction project in depth, in terms of process and materials, but to try to accustom the student to the use of BIM tools for everyday use, which entails a certain rigor compared to other drawing methods.

Specific objectives:

- Start an architectural project in Revit.
- Model basic walls and floors.
- Add doors and windows.
- Add furniture.
- Add dimensions to the model.
- Search external libraries.
- Modify existing model.
- Create new views and plans.
- Organize the project browser.
- Create rooms.
- Create data tables.
- Produce various floor plans with various information.

Material:

Guided guide and support websites.

Delivery:

Delivery of guided work as class attendance.

Full-or-part-time: 6h

Theory classes: 6h

A02 - Detached House 2 floors

Description:

Collaboration is essential in developing a BIM-based project. In this first complete two-storey house model, we will work first on the structure model, and then on the architecture model, making it clear that they could be done by different agents in the process who must work collaboratively.

Specific objectives:

- Import CAD file.
- Organize the model with grids and levels.
- Develop a foundation.
- Model a basic structure system, without calculations.
- Get structure model.
- Create a stair system.
- Create insitu objects.
- Create structure plans.
- Create multilayer walls.
- Add images to plans.
- Create multilayer floors.
- Create ceilings.
- Create flat roofs and formalize slopes.
- Model objects by sweep.
- Create simple terrain at a height and manipulate it.
- Create platforms on land.
- Create a pergola with a beam system.
- Rotate views to adapt plans.

Material:

Guided guide and support websites.

Delivery:

Delivery of guided work as class attendance.

Full-or-part-time: 10h

Theory classes: 10h

A03 - Industrial warehouse

Description:

We will make an industrial warehouse to treat other materials and construction procedures than those previously seen. We will use a metal structure to house a work area and a loft with offices.

Specific objectives:

- Create a simple metal structure.
- Work with metal connections.
- Create metal beam systems.
- Work with reference planes.
- Create curtain walls.
- Create gable roofs.

Material:

Guided guide and support websites.

Delivery:

Delivery of guided work as class attendance.

Full-or-part-time: 4h

Theory classes: 4h



A04 - Project analysis

Description:

Through the Naviswoks program we will take the role of BIM manager.

Specific objectives:

- Manage Naviswoks files.
- Navigate the model to obtain and report information.
- Looking for construction design problems.
- Manage planning as BIM manager.

Material:

Guided guide and support websites.

Delivery:

Delivery of guided work as class attendance.

Full-or-part-time: 4h

Theory classes: 4h

GRADING SYSTEM

20% - Attendance or delivery of weekly activities.

30% - Project 1 (Revit) + Validation test.

30% - Project 2 (Revit) + Validation test.

20% - P1 and P2 Analysis (Navisworks)

This subject will have a re-evaluation period after the final exam period.

RESOURCES

Hyperlink:

- CTE - Código técnico de la Edificación. <https://www.codigotecnico.org/index.html>

Other resources:

Revit and Navisworks are one of the most used programs for creating and managing architectural models under the BIM methodology. Any doubt about any tool or procedure available in them, finds multiple resolution guides, in the Internet search engines.