Course guide
310089 - 310089 - Virtual Representation of Interior Design

Last modified: 06/06/2024

Unit in charge: Barcelona School of Building Construction
Teaching unit: 752 - RA - Departamento de Representación Arquitectónica.

Degree: BACHELOR'S DEGREE IN ARCHITECTURAL TECHNOLOGY AND BUILDING CONSTRUCTION (Syllabus 2015). (Optional subject).

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

LECTURER

Coordinating lecturer: JUAN MANUEL CORSO SARMIENTO

Others: JUAN MANUEL CORSO SARMIENTO

PRIOR SKILLS

Basic knowledge of CAD, 3D models and Graphic expression

REQUIREMENTS

Basic knowledge of 3D

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. 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.
2. FE-1 Ability to understand and make the graphical documentation of a project, to do data gathering, surveying of plans and geometric control of construction units.
3. FE-2 Knowledge of the infographic and cartographic procedures and methods in the construction field.
4. FE-28 Aptitude to write technical projects of constructions, which don¿t require architectural projects, as well as projects of demolition and design.
5. FE-33 Exposition and defence, before a university committee, of a final of degree project, consisting in an exercise of assimilation of the educational contents received and the competences acquired.

Transversal:
6. SELF-DIRECTED LEARNING. Detecting gaps in one's knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one's knowledge.
7. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.
8. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.

TEACHING METHODOLOGY

The central idea is that students improve their skills in the field of 3D, to the point that they can develop an interactive, which allows them to teach a 3D project in its current state and as it would be after the reform, from the same point of view , the fact of being interactive adds value, being able to work the project from all possible points and generate skills in the explanation of said reforms. This is carried out both with a design of a 3D platform, and with the explanation of such reform through a 2D design.

Two projects will be carried out transversally throughout the classes, with continuous corrections every 15 days, to follow up on the work carried out.
The aim is to cover all the tools for the presentation of interior refurbishment projects, through the development of interactive applications that allow the correct dissemination and visualization of the projects.

The first exercise will be based on a 3D model, of an equal type architectural space for the whole class, previously modeled, to explain the casuistry of 3D models in general and how 3D works for interactive and rendering. This model must reach the point of generating an interactive virtual tour, with an optimal level of visualization, mainly in lighting, materials, interface and graphic expression of the project.

The second project will be based on the work developed in the project of the DAC interior project, or models to be agreed with the teacher. In the same way that is developed in the previous exercise, you should look for its correct visualization with an interactive platform. The level of detail of the project will depend on the time of the project, reaching the point of being able to compare the current state with the integral reform in a single visualization, thanks to the application development tools exposed in the course.

As final works, the two applications and images that can be included in the posters and reports of the projects will be delivered.
Programs used: 3D modeling software and the Unity 3D program download free https://store.unity.com/en

LEARNING OBJECTIVES OF THE SUBJECT

That the students have tools that allow them to communicate more clearly the ideas they project, with fast and eye-catching techniques that allow them to redirect their efforts supported by good planning, with a leading program in the field of virtual environments such as It's Unity 3D.

At present, computer programs are increasingly intuitive and some are optimized to the point that they do not require technical training for their use, which allows us to focus on specific fields of knowledge. An example of this is Unity3D, a programming platform that architects can use without leaving our profession, dedicating ourselves fully to the creation of content, with which we can better communicate our ideas, achieving preview our projects, disseminate work completely and with a degree of depth that depends solely on ourselves.

That is why the need arises to provide tools for the communication of projects, both at an architectural and urban scale, within a professional production platform such as Unity3D.

Unity3D is a multiplatform program, which can be downloaded from the internet free of charge and which, under the necessary licenses, can generate content for Windows, MacOSX, Xbox360, PlayStation, Wii, iPad, iPhone and Android. In this course the version that allows the creation of contents by Windows will be used.

STUDY LOAD

Type	Hours	Percentage
Hours large group	6,0	8.00
Hours medium group	24,0	32.00
Self study	45,0	60.00

Total learning time: 75 h

CONTENTS

C1 Block 1. 3D Virtual representation

Description:
1. Introduction
1.1. Unity 3D interface
1.2. General concepts
1.3. Architectural examples

2. Navigation and context
2.1. Create a new project
2.2. Interaction and navigation
2.3. Prefabricated or parametric models
2.4. The context (Sky, Procedural vegetation and trees)

3. 3D Models
3.1. The materials
3.2. UV Maps
3.3. Shaders Unity3D
3.4. Import 3D models
3.5. Import application packages

Specific objectives:
Topic 1: Introduction
Students will learn the concepts, the interface and basic elements to perform interactive architectural applications, making an introduction to the Unity3D engine as a representation platform.

Topic 2: Optimization of 3D Models
This unit will relate the most used programs in 3D Architecture, in the creation of the platform, focusing on the correction of UV maps, the topology of 3D models, materials and textures, taking into consideration the updating of the models in the evolution of the project, in the relation of the programs used.

Topic 3: Navigation and context
The first interactive application project for interior renovations will be carried out, with a typical project, which will be focused on creating a realistic atmosphere. Having finished this scene the browsers will be explained, in order to make different visualizations of this information.

Related activities:
There will be individual or group practices that will be delivered Via Atenea and Wetransfer.

Full-or-part-time: 35h
Theory classes: 7h
Practical classes: 7h
Self study : 21h

C2 Block 2. Optimization, 2D and 3D interfaces

Description:
4. 2D images and menus
4.1. Understand the texture and buttons GUI
4.2. Scripting GUI
4.3. 2D Menus
4.4. 3D Menus
4.5. Scripting menus

5. Basic programming
5.1. Variables, syntax and functions
5.2. Predefined words, public scripts
5.3. Animate objects, animate routes
5.4. Interact with animated and physical objects

6. Optimization of the platform
6.1. Lighting textures
6.2. Typological errors of 3D models
6.3. Processing analysis

7. Export project
7.1. The export menu
7.2. Quality adjustments and formats

Specific objectives:
Topic 4: Images and 2D design for interactive project presentation
We will introduce ourselves in the interaction with contents in two dimensions, being this fundamental for specific presentations and to generate elements of interaction as menus or guides, from GUI subsystems in the Unity3D.

Topic 5: Basic programming
Basic programming concepts will be learned, allowing the reading of free scripts and their application. Physics interactions, model animations from the modeling programs and from Unity3D will also be explained, concluding this section with the generation of different types of routes and guided.

Topic 6: Optimization of the platform
We will introduce a higher level of realism with the lighting through textures, and the optimization of the platform, allowing us a more fluid interaction between the scenes and created contents.

Topic 7: Final project
The above concepts will be applied in the project developed in the interior refurbishment project that is developed in class. We will review the final quality of the application, in relation to the platform to which it will be addressed, taking the pertinent considerations in the export to mobile devices, computers or the web, allowing a greater diffusion of our design proposals.

Related activities:
There will be done practices individually or in groups of two members which will be deliveried by Atenea and Wetransfer.

Depending on the rhythm in class, the development of the app will be complemented with the development of a 4K video from the developed application.

Full-or-part-time: 40h
Theory classes: 8h
Practical classes: 8h
Self study : 24h

ACTIVITIES

C1 Block 1. Correction of a 3D model and development of an App

Description:
Exercises will be made, which will be part of the development of an interactive App. This will serve to assess the graphic knowledge acquired in each phase of the course.

Specific objectives:
• Consolidation of knowledge of 3D models and their problems according to how they were modeled
• Specific concepts of application development using Unity3d.
• To create architectural presentations of low complexity, in 2D and 3D.
• Virtual interaction with architectural projects and interior design
• Creativity for the presentation of projects
• Ability to apply technical resources for project communication

Material:
3d model of the first project, downloadable internet material compatible with 3D software.
Daily introduction to train the fundamental points of the apps and 3D in general. Summaries in pdf. Powerpoints and Unity 3D projects as examples of classes.

Delivery:
A specific project will be developed, which will allow to know the problems of 3D. This model will be corrected and an app will be made until it is exported.

Full-or-part-time: 1h
Theory classes: 1h

C2. Block 2. App of reform of interiors, 2D and 3D

Description:
Exercises will be made, which will be part of the development of an interactive App. This will serve to assess the graphic knowledge acquired in each phase of the course.

Specific objectives:
• Consolidation of knowledge of 3D models and their problems according to how they were modeled
• Know the process of creating an interactive architectural visualization, as well as each of the parties involved.
• Identify the elements involved in the programming and design of an interactive architectural visualization.
• Learn to use the software tools and software solutions.
• Specific concepts of application development using Unity3d.
• To create architectural presentations of low complexity, in 2D and 3D.
• Virtual interaction with architectural projects and interior design
• Creativity for the presentation of projects
• Ability to apply technical resources for project communication

Material:
3d model of the first project, downloadable internet material compatible with 3D software.
Daily introduction to train the fundamental points of the apps and 3D in general. Summaries in pdf. Powerpoints and Unity 3D projects as examples of classes.

Delivery:
A specific project will be developed, which allows to know the problems of the 3D. This model will be corrected and an app will be made until it is exported.

Full-or-part-time: 1h
Theory classes: 1h

GRADING SYSTEM

There will be a continuous evaluation throughout the classes. Two jobs will be delivered, one will be 40% of the evaluation and the final project will be 60% missing. The evaluation is performed on a value of 10.

EXAMINATION RULES.

It is an essential condition to do all the activities to access to the final mark.

BIBLIOGRAPHY

Basic:

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RESOURCES

Other resources:

https://unity.com/es />https://unity3d.com/es/get-unity/download />http://juancorso.com/descargas-para-3d/ />http://juancorso.com/sobre/