

Course guide

310758 - 310758 - Interior Design Project

Last modified: 18/10/2023

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 2019).
(Optional subject).

Academic year: 2023 **ECTS Credits:** 3.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: JANINA PUIG COSTA

Others: JANINA PUIG COSTA

PRIOR SKILLS

Have knowledge of CAD, image retouching (GIMP, Photoshop,...), construction, installations and structures

REQUIREMENTS

To have passed or be in the 3rd year of the Degree in Technical Architecture and Building.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

FB-03. 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.

FE-01. 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.

FE-02. FE-2 Knowledge of the infographic and cartographic procedures and methods in the construction field.

FE-04. 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.

FE-07. FE-7 Ability to identify the constructive elements and systems, define its function and compatibility, and its implementation to construction in the construction process. Plan and solve constructive details.

FE-14. FE-14 Aptitude to apply the specific regulations about facilities in the construction process.

FE-27. FE-27 Ability to apply the necessary advanced tools for the resolution of the parts which the technical project implies and its management.

FE-28. FE-28 Aptitude to write technical projects of constructions, which don't require architectural projects, as well as projects of demolition and design.

FE-33. 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:

07 AAT. 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.

04 COE. 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.

05 TEQ N2. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.



TEACHING METHODOLOGY

Audiovisual material:

Presentation of the theoretical classes in the classroom using a projector, internet, ChatGPT, RoomGPT and PPT presentations or similar.

Computer Material:

The theoretical topics will be posted on the school intranet (ATENEA), as well as any statement in PDF.

Communication in a specific case with students will also be through ATENEA and its internal mail.

LEARNING OBJECTIVES OF THE SUBJECT

At the end of the subject, the students should be able to:

- Determine: the important parameters when projecting.
- Have an orderly methodology in the database of a project
- Relate: architecture and energy consumption
- Graphically define architectural analysis systems.
- Teamwork through network and large databases
- Being able to analyze a building using architectural data

STUDY LOAD

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

Total learning time: 75 h

CONTENTS

C1_ Introduction to AI applied to Architectural Representation

Description:

- Basic concepts of Artificial Intelligence applied to Architectural Representation
- Brief review of the fundamentals of architecture
- Applications and benefits of Artificial Intelligence in architecture

Specific objectives:

Introduce the student in the basic knowledge of the architecture history and its evolution. To have basic cultural knowledge, regarding to the architecture.

Related activities:

There will be done questionnaires about the teaching material which will be useful to understand the topic deeply.

At the same time the students will start to prepare the project to analyze.

Full-or-part-time: 3h

Theory classes: 1h

Practical classes: 2h

C2_Data analysis and recognition of Patrons in Architecture

Description:

- First CAD tools at the end of the 20th century
- The case of UnStudio, architecture according to Ben Van Berkel
- Group activity aimed at data analysis and pattern recognition

Specific objectives:

Have a mental order when starting a building project

Related activities:

Class groups of 6 people will be made to develop a work on a work of UnStudio or similar. Each group will carry out an analysis of the data that has led to the solution adopted by the architect and will present the conclusions in a class presentation.

Full-or-part-time: 13h 40m

Theory classes: 2h

Practical classes: 4h

Self study : 7h 40m

C3_Automatic generation of architectural designs

Description:

- Genetic algorithms and optimization for automatic design generation
- Software tools and techniques for the automatic generation of architectural designs
- Case studies of automatic generation of architectural designs

Specific objectives:

The architecture of a genetic algorithm includes an initial population of chromosomes that represents possible solutions. These chromosomes undergo genetic operators such as recombination and mutation to generate new solutions. Subsequently, the solutions are evaluated with an objective function and the best individuals are selected for the next generation. This process is repeated until an optimal solution or defined criterion is found.

Public works: networking with large data repositories: Cartographic, Cadastre, PiU, Topographic

Full-or-part-time: 5h

Theory classes: 1h

Practical classes: 2h

Self study : 2h

C4_Conversation with the ChatGpt assistant

Description:

- The importance of language and Natural Language (NLP) in communication with the machine
- The answer as a numerical parameter: length or number of words, content index
- Critical analysis of the tool, learning to work on it

Specific objectives:

Conversations will be held with the assistant about architectural doubts; regulations, facilities, buildings, cadastre, etc. Critical response will be given on answers obtained; sources used, % of correct answers, optimization of the use of the machine according to its scheme of work and operation

Full-or-part-time: 6h

Theory classes: 1h

Practical classes: 2h

Self study : 3h

C5_Simulation of architectural environments

Description:

- Importance of simulation in architectural representation
- Modeling of energy behavior of buildings
- Simulation tools and techniques for space optimization

Specific objectives:

The Technical Building Code is designed to respond to the energy behavior of buildings based on their envelope. Application of neural networks in architecture; In the EEC energy certifications there is a section on possible improvements, criteria to take into account and recommended insulation thicknesses.

Related activities:

This activity will be carried out in the computer room.

Specific software LIDER CALENER HULC

An individual activity will be carried out aimed at auditing the behavior of the student's home and it will be verified if the result corresponds to the comfort intuited by the resident before obtaining a calculated response.

Full-or-part-time: 17h

Theory classes: 1h

Practical classes: 4h

Self study : 12h

C6_Virtual and Augmented Reality in architectural representation

Description:

- Introduction to virtual and augmented reality applied to architecture
- Immersive visualization of architectural designs
- Creation of interactive experiences using virtual and augmented reality technologies

Related activities:

Google glasses will be used in class with specific immersive experience software

Guided tour of the CCCB Barcelona exhibition on Artificial Intelligence

Full-or-part-time: 14h

Theory classes: 1h

Practical classes: 2h

Self study : 11h

C7_Designing interiors with RoomGpt

Description:

- Basic concepts of photographic restitution: construction of perspectives
- Interior design subjected to architectural styles: art nouveau, eclectic, classic,...
- Critical analysis of the operation of the machine: Computer Vision

Related activities:

From the photograph chosen from the student's mobile by the teacher, photographic restitution will be made with CAD tools or paper

Full-or-part-time: 20h

Theory classes: 11h

Practical classes: 1h

Self study : 8h

C8_Challenges and Future of Artificial Intelligence in Architecture

Description:

- Current and future challenges in the application of Artificial Intelligence in Architectural Representation
- Emerging trends and possible future directions: ethics = normative
- Summary of the course and final conclusions

Full-or-part-time: 3h

Theory classes: 1h

Self study : 2h

GRADING SYSTEM

There will be public exhibitions and deliveries via Atenea of the requested works. The weight that each of the scoring activities will have in the final grade for the course will be the following:

A1: 2/10

A2: 1/10

A3: 4/10

A4: 3/10

EXAMINATION RULES.

- The tests will be scored from 1 to 10
- There will be individual and group deliveries
- For deliveries, the result is as important as the methodology followed to obtain it

BIBLIOGRAPHY

Basic:

- Ben Van Berkel, Caroline Bos. move. UN Studio & Goose Press. UN Studio & Goose Press, 1999. ISBN 10:9076517010 .
- Aurora, H., Bielski, J., Eisenstadt, V., Langenhan, C., Ziegler, C., Althoff, K.-D., & Dengel, A. . "Consistency Checker: An automatic constraint-based evaluator for housing spatial configurations.". Proceedings of the International Conference on Education and Research in Computer Aided Architectural Design in Europe, 2.
- Premis FAD 1958-2001, ARQ-INFAD, arquitectura i interiorisme: el llibre dels Premis FAD. Barcelona: ARQ-INFAD, 2002. ISBN 8460743268.
- Neufert, Peter; Neff, Ludwig. Casa vivienda jardín. 2a ed. Barcelona: Gustavo Gili, 2007. ISBN 9788425220951.
- Zelanski, P. ; Fisher, M.P. Color. Barcelona: Blume, 2001.
- Ching, Frank. Arquitectura: forma espacio y orden. 3a ed. Barcelona: Gustavo Gili, 2010. ISBN 9788425223440.

Complementary:

- Almufarrej, A. M., & Erfani, T.. "Climate, buildings' envelope design and energy patterns: Improving energy performance of new buildings in Kuwait.". Engineering, Construction and Architectural Management, 30 [on line]. Available on: <https://doi.org/10.1108/ECAM-04-2021-0360>.
- Abrishami, S., Goulding, J., & Rahimian, F. . "Generative BIM workspace for AEC conceptual design automation: Prototype development.". Engineering, Construction and Architectural Management, 28 [on line]. 482-509Available on: <https://doi.org/10.1108/ECAM-04-2020-0256>.
- Ayoub, S., Khan, M. A., Jadhav, V. P., Anandaram, H., Anil Kumar, T. C., Reegu, F. A., Motwani, D., Shrivastava, A. K., & Berhane, R.. "Minimized Computations of Deep Learning Technique for Early Diagnosis of Diabetic Retinopathy Using IoT-Based Medical Devices. ". Computational Intelligence and Neuroscience, 2022 [on line]. Available on: <https://doi.org/10.1155/2022/7040141>.
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- Bilandzic, M., & Foth, M. Libraries as coworking spaces. Library Hi Tech [on line]. 2013Available on: <http://doi.org/10.1108/07378831311329040>.
- Broto, Carles. Superb Shops: Innovative & Design. Barcelona: Links Books, 2014. ISBN 978 84 9054 196 8.
- Ali, K. N., Alhajlah, H. H., & Kassem, M. A.. "Collaboration and Risk in Building Information Modelling (BIM): A Systematic Literature Review". Buildings, 12 [on line]. Available on: <https://doi.org/10.3390/buildings12050571>.
- Garrett, L. E., Spreitzer, G. M., & Bacevice, P. A. . Co-constructing a Sense of Community at Work: The Emergence of Community in Coworking Spaces. [on line].



2017 Available on: <http://doi.org/10.1177/0170840616685354>.

RESOURCES

Hyperlink:

- <https://www.plataformaarquitectura.cl/cl/>. Architecture
- <https://www.archdaily.com/>. Architecture
- <https://www.dezeen.com/>. Architecture
- <http://www.formaarquitectura.com/inicio/>. Architecture
- <https://www.arquitectes.cat/>. Architects college of Catalonia
- <https://biblioteca.upc.edu/>. Online UPC library

Other resources:

- Atenea UPC
- Codi Tècnic de l'Edificació (2006) Madrid : Ministerio de Vivienda : Boletín Oficial del Estado.
- LIDER CALENER-HULC de la web del Ministeri
- DECRET 141/2012, de 30 d'octubre, pel qual es regulen les condicions mínimes d'habitabilitat dels habitatges i la cèdula d'habitabilitat
- PIU: Portal de Información Urbanística de l'Ajuntament de Barcelona
- Sede electrónica del Cadastro de España