

Course guide

210351 - IAA - Artificial Intelligence and Architecture

Last modified: 01/07/2025

Unit in charge: Barcelona School of Architecture
Teaching unit: 752 - RA - Departamento de Representación Arquitectónica.
Degree: DEGREE IN ARCHITECTURE STUDIES (Syllabus 2014). (Optional subject).
Academic year: 2025 **ECTS Credits:** 4.0 **Languages:** Spanish

LECTURER

Coordinating lecturer:

Others: Segon quadrimestre:
 ISIDRO NAVARRO DELGADO - 2SM
 JANINA PUIG COSTA - 2SM

PRIOR SKILLS

No prerequisites

REQUIREMENTS

No prerequisites

TEACHING METHODOLOGY

A 20-minute presentation will be given at the beginning of each session on the class practice.
 After the presentation, students will practice learning methodologies based on generative artificial intelligence (image and video production).

LEARNING OBJECTIVES OF THE SUBJECT

1. Evaluate the use of artificial intelligence in solving architectural problems: perspective, lighting, furniture, and materials (textures).
2. Understand the various artificial intelligence tools available and their potential applications.
3. Research new working methodologies incorporating artificial intelligence.
4. Train the machine to generate project images from: sketches, photographs of the current state, 3D models (vector space), text filters, etc.
5. Prioritize human judgment (project premises) over the randomness (lack of control) of artificial intelligence.
6. Determine the needs of each phase of the architectural design project: Identify the needs of the functional program, organize spaces based on the user journey, and study the sequence of architectural images (visuals of the tour, video)

STUDY LOAD

Type	Hours	Percentage
Self study	60,0	60.00
Hours large group	40,0	40.00

Total learning time: 100 h

CONTENTS

C1_Introduction to Artificial Intelligence applied to Architecture

Description:

Basic concepts of generative artificial intelligence.
A brief review of the foundations of architecture as a human project and the current human-machine contradiction.
Applications of artificial intelligence in architecture.

Specific objectives:

To introduce the student to the history of architecture from the point of view of architectural representation

Related activities:

An initial test will be carried out to assess the student's prior knowledge in the representation of bodies and architectures

Full-or-part-time: 3h

Theory classes: 1h

Practical classes: 2h

C2_Indoor reform

Description:

The origin of generative image intelligence: Dall-e, ChatGPT, and RoomsGPT
Spatial mastery of an interior from a photograph: photographic restitution

Specific objectives:

Applying artificial intelligence in an architectural exercise of interior renovation

Related activities:

ACTIVITY 1_Interior renovation of a home

Full-or-part-time: 11h

Theory classes: 2h

Practical classes: 4h

Self study : 5h

C3_Automatic generation of three-dimensional models

Description:

Basic functions of artificial intelligence applications for generating architectural models (CAD plugins)
BIM-AI synergies
3D surveying of architectural interiors

Specific objectives:

Control of functional layouts and building envelopes with artificial intelligence

Related activities:

ACTIVITY 2_Architectural project

Full-or-part-time: 12h

Theory classes: 2h

Practical classes: 5h

Self study : 5h

C4_Architectural Styles and References

Description:

Importance of architectural discourse and its attribution to a style
Ethical and inclusive training of artificial intelligence with images of local architectural styles
LORAs as databases (images) of architectural styles

Specific objectives:

New paradigm: learning to work and train with artificial intelligence tools in an ethical and inclusive manner

Related activities:

ACTIVITY 3_Presentation of an architectural project (in a group)

Full-or-part-time: 8h

Theory classes: 2h

Practical classes: 2h

Self study : 4h

C5_Architectural project

Description:

The architectural project and its digital evolution (20th and 21st centuries)
Control of project plans and sections

Specific objectives:

Learn about the history of digitalization in architecture and its spatial consequences.
Learn about the latest developments in industrial and architectural design.

Related activities:

ACTIVITY 2_Architectural project

Full-or-part-time: 6h

Theory classes: 2h

Practical classes: 2h

Self study : 2h

GRADING SYSTEM

Continuous evaluation

Grading will be continuous; there will be no exams.

A series of individual and group assignments are scheduled throughout the course.

The course grade will be the average of the partial assignments.

Final evaluation

If the continued evaluation is not positive, a second test can be performed this one will consist in a final test of global character in the format established according with the criteria of the responsible teacher (written and oral test and/or delivery of work).

EXAMINATION RULES.

It is necessary to have submitted all the practical exercises to obtain a minimum passing grade

BIBLIOGRAPHY

Basic:

- Berkel, Ben van; Bos, Caroline.. Move. Amsterdam: UN Studio & Goose, 1999. ISBN 9076517010.
- Ching, Frank.. Arquitectura : forma, espacio y orden. Barcelona: Gustavo Gili, 2010. ISBN 991003756029706711.
- Ching, Frank; Binggeli, Corky.. Diseño de interiores : un manual [on line]. Barcelona: Gustavo Gili, 2011 [Consultation: 19/06/2025]. Available on: https://discovery.upc.edu/permalink/34CSUC_UPC/18e7aks/alma991005120312206711. ISBN 9788425223983.
- Leach, Neil. Architecture in the age of artificial intelligence : an introduction to AI for architects. Great Britain: Bloomsbury Visual Arts, 2021. ISBN 9781350165519.
- Chaillou, Stanislas. Artificial intelligence and architecture : from research to practice [on line]. Basel: Birkhäuser, 2022 [Consultation: 20/06/2025]. Available on: https://discovery.upc.edu/permalink/34CSUC_UPC/18e7aks/alma991004949815406711. ISBN 9783035624007.
- Ford, Martin. Architects of intelligence : the truth about AI from the people building it [on line]. Birmingham, UK: Packt Publishing Ltd, 2018 [Consultation: 20/06/2025]. Available on: https://discovery.upc.edu/permalink/34CSUC_UPC/18e7aks/alma991001685349706711. ISBN 9781789131260.

Complementary:

- Bravo, C.; Aguilar-Catro, J., Ríos, A., Aguilar-Martín, J., Rivas, F. "Arquitectura basada en inteligencia artificial distribuida para la gerencia integrada de producción industrial". Revista iberoamericana de automática e informática industrial [on line]. [Consultation: 20/06/2025]. Available on: https://discovery.upc.edu/permalink/34CSUC_UPC/1tihbob/cdi_crossref_citationtrail_10_1016_j_riai_2011_09_013.