**الجمهورية الجزائرية الديمقراطية الشعبية**

وزارة التعليم العالي والبحث العلمي

**PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA**

**MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH**

# Training Program Leading to the Degree of Architect

| Institution | Faculty / Institute | Department |
|---|---|---|
| **Hassiba Benbouali University of Chlef** | **Faculty of Civil Engineering and Architecture** | **Architecture** |

**Field of Study:** AUMV
**Architecture, Urban Planning, and Urban Professions**

**Program:** Architecture
**Specialization:** Architecture

**Academic Year:** 2023/2024

## 1. Semestre 1 :

| Nature of the Course Content | "Course Title" | VHS 15 sem. | Weekly Hours | | | | | Mode of Assessment | | Coefficient | Eliminatory Grade |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Studio | Lecture | Tutorial | Praticl work | Internship | Continu | Examen | | |
| FI 1 | Project Workshop 1 | 180h | 12h | | | | | 100 % | | 4 | < 10/20 |
| | History of Architecture1 | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 07/20 |
| | Design Theory 1 | 22h30 | | 1h30 | | | | | 100 % | 2 | < 07/20 |
| AI 1 | Spatial Geometry 1 | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 05/20 |
| | Construction Materials Technology 1 | 45h | | 1h30 | | 1h30 | | 40 % | 60 % | 2 | < 05/20 |
| | Mathematics | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 05/20 |
| TRI 1 | Oral Expression | 22h30 | | | 1h30 | | | 100 % | | 1 | < 05/20 |
| PI 1 | Introductory Internship 1 | 45h | | | | | 3h | 100 % | | 1 | < 05/20 |
| Total | | **450h** | **12h** | **7h30** | **6h** | **1h30** | **3h** | | | **16** | |

## 2. Semester 2 :

| Nature of the Course Content | Course Title | VHS | Weekly Hours | | | | | Mode of Assessment | | Coefficient | Eliminatory Grade |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Studio | Lecture | Tutorial | Practical Work | Internship | Continu | Examen | | |
| **FI 2** | Project Workshop 2 | 180h | 12h | | | | | 100 % | | 4 | < 10/20 |
| | History of Architecture2 | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 07/20 |
| | Design Theory 2 | 22h30 | | 1h30 | | | | | 100 % | 2 | < 07/20 |
| **EI 2** | Spatial Geometry II | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 05/20 |
| | Construction Materials Technology 2 | 45h | | 1h30 | | 1h30 | | 40 % | 60 % | 2 | < 05/20 |
| | **Building Physics** | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 05/20 |
| **TRI 2** | **Written Expression** | 22h30 | | | 1h30 | | | 100 % | | 1 | < 05/20 |
| **PI 2** | Stage découverte 2 | 45h | | | | | 3h | 100 % | | 1 | < 05/20 |
| Total | | **450h** | **12h** | **7h30** | **6h** | **1h30** | **3h** | | | **16** | |

## 3. Semester 3 :

| Nature of the Course Content | Course Title | VHS | Weekly Hours | | | | | Mode of Assessment | | Coefficient | Eliminatory Grade |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Studio | Lecture | Tutorial | Practical Work | Internship | Continu | Examen | | |
| **FI 3** | Project Workshop 3 | 180h | 12h | | | | | 100 % | | 4 | < 10/20 |
| | History of Architecture3 | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 07/20 |
| | Design Theory 3 | 22h30 | | 1h30 | | | | | 100 % | 2 | < 07/20 |
| **AI 3** | Construction I | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 05/20 |
| | Strength of Materials I (RDM I) | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 05/20 |
| | Computer-Aided Drafting (CAD) | 45h | | 1h30 | | 1h30 | | 40 % | 60 % | 1 | < 05/20 |
| **TRI 3** | Spatial Analysis and Cartography | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 1 | < 05/20 |
| | Sociology and Anthropology of Space | 22h30 | | 1h30 | | | | | 100 % | 1 | < 05/20 |
| **PI 3** | Introductory Internship III | 45h | | | | | 3h | 100 % | | 1 | < 05/20 |
| Total | | **495h** | **12h** | **10h30** | **6h** | **1h30** | **3h** | | | **16** | |

## 4. Semester 4 :

| Nature of the Course Content | Course Title | VHS | Weekly Hours | | | | | Mode of Assessment | | Coefficient | Eliminatory Grade |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Studio | Lecture | Tutorial | Practical Work | Internship | Continu | Examen | | |
| **FI 4** | Project Workshop 4 | 180h | 12h | | | | | 100 % | | 4 | < 10/20 |
| | History of Architecture4 | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 07/20 |
| | Design Theory 4 | 22h30 | | 1h30 | | | | | 100 % | 2 | < 07/20 |
| **AI 4** | Construction II | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 05/20 |
| | Strength of Materials II | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 05/20 |
| | **Computer-Aided Design (CAD)** | 45h | | 1h30 | | 1h30 | | 40 % | 60 % | 1 | < 05/20 |
| **TRI 4** | **Surveying Techniques** | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 1 | < 05/20 |
| | **Anthropology of Habitat** | 22h30 | | 1h30 | | | | | 100 % | 1 | < 05/20 |
| **PI 4** | Introductory Internship IV | 45h | | | | | 3h | 100 % | | 1 | < 05/20 |
| Total | | **495h** | **12h** | **10h30** | **6h** | **1h30** | **3h** | | | **16** | |

## 5. Semester 5 :

| Nature of the Course Content | Course Title | VHS | Weekly Hours | | | | | Mode of Assessment | | Coefficient | Eliminatory Grade |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Studio | Lecture | Tutorial | Practical Work | Internship | Continu | Examen | | |
| **FI 5** | Project Workshop 5 | 180h | 12h | | | | | 100 % | | 4 | < 10/20 |
| | History of Architecture5 | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 07/20 |
| | Design Theory 5 | 22h30 | | 1h30 | | | | | 100 % | 2 | < 07/20 |
| | **Architectural Structures I** | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 05/20 |
| **AI 5** | Building Systems I | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 05/20 |
| | **Modeling and Simulation I** | 45h | | | | 3h | | 100 % | | 1 | < 05/20 |
| **TRI 5** | Urban design | 22h30 | | 1h30 | | | | | 100 % | 1 | < 05/20 |
| | Urban and Housing Geography | 22h30 | | 1h30 | | | | | 100 % | 1 | < 05/20 |
| **PI 5** | **Practical Internship I** | 45h | | | | | 3h | 100 % | | 1 | < 05/20 |
| Total | | **472h30** | **12h** | **9h** | **4h30** | **3h** | **3h** | | | **16** | |

## 6. Semester 6 :

| Nature of the Course Content | Course Title | VHS | Weekly Hours | | | | | Mode of Assessment | | Coefficient | Eliminatory Grade |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Studio | Lecture | Tutorial | Practical Work | Internship | Continu | Examen | | |
| **FI 6** | Project Workshop 6 | 180h | 12h | | | | | 100 % | | 4 | < 10/20 |
| | History of Architecture6 | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 07/20 |
| | Design Theory 6 | 22h30 | | 1h30 | | | | | 100 % | 2 | < 07/20 |
| | Architectural Structures II | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 05/20 |
| **AI 6** | Building Systems II | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 05/20 |
| | Modeling and Simulation II | 45h | | | | 3h | | 100 % | | 1 | < 05/20 |
| **TRI 6** | Introduction to Urban Planning | 22h30 | | 1h30 | | | | | 100 % | 1 | < 05/20 |
| | **Tools and Methods of Urban Analysis** | 22h30 | | 1h30 | | | | | 100 % | 1 | < 05/20 |
| **PI 6** | Practical Internship II | 45h | | | | | 3h | 100 % | | 1 | < 05/20 |
| Total | | **472h30** | **12h** | **9h** | **4h30** | **3h** | **3h** | | | **16** | |

## 7. Semester 7 :

| Nature of the Course Content | Course Title | VHS | Weekly Hours | | | | | Mode of Assessment | | Coefficient | Eliminatory Grade |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Studio | Lecture | Tutorial | Practical Work | Internship | Continu | Examen | | |
| **FI 7** | Project Workshop 7 | 180h | 12h | | | | | 100 % | | 4 | < 10/20 |
| | Urban and Architectural Programming | 22h30 | | 1h30 | | | | | 100 % | 2 | < 07/20 |
| | Architectural Structures III | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 07/20 |
| **AI 7** | **Building Systems III** – | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 05/20 |
| | Roads and Utility Networks | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 05/20 |
| **TRI 7** | **Sustainable Architecture and City** | 22h30 | | 1h30 | | | | | 100 % | 1 | < 05/20 |
| | Architectural and Urban Heritage | 22h30 | | 1h30 | | | | | 100 % | 1 | < 05/20 |
| **PI 7** | Practical Internship III | **45h** | | | | | 3h | | | 2 | |
| Total | | 427h30 | 12h | 9h00 | 4h30 | | 3h | | | 16 | |

## 8. Semester8 :

| Nature of the Course Content | Course Title | VHS | Weekly Hours | | | | | Mode of Assessment | | Coefficient | Eliminatory Grade |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Studio | Lecture | Tutorial | Practical Work | Internship | Continu | Examen | | |
| **FI 8** | Project Workshop 8 | 180h | 12h | | | | | 100 % | | 4 | < 10/20 |
| | **Project Management and Contracting Authority** | 22h30 | | 1h30 | | | | | 100 % | 2 | < 07/20 |
| | **Architectural Structures IV** | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 07/20 |
| **AI 8** | Secondary Building Trades | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 05/20 |
| | Decision Support Tools | 45h | | 1h30 | | 1h30 | | 40 % | 60 % | 1 | < 05/20 |
| | **Introduction to Research Methodology** | 22h30 | | 1h30 | | | | | 100 % | 1 | < 05/20 |
| **TRI 8** | **Construction and Urban Planning Law** | 22h30 | | 1h30 | | | | | 100 % | 1 | < 05/20 |
| | Ethics and Professional Conduct | 22h30 | | 1h30 | | | | | | 1 | |
| **PI 8** | Practical Internship IV | 45h | | | | | 3h | 100 % | | 2 | < 05/20 |
| Total | | **450h** | **12h** | **9h00** | **3h** | **1h30** | **3h** | | | **16** | |

## 9. Semester 9 :

| Nature of the Course Content | Course Title | VHS | Weekly Hours | | | | | Mode of Assessment | | Coefficient | Eliminatory Grade |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Studio | Lecture | Tutorial | Practical Work | Internship | Continu | Examen | | |
| **FI 9** | Project Workshop 9 | 180h | 12h | | | | | 100 % | | 8 | < 10/20 |
| | Performance énergétique dans le bâtiment | 45h | | 1h30 | 1h30 | | | 40 % | 60 % | 2 | < 07/20 |
| **AI 9** | Entrepreneuriat et management de projet | 22h30 | | 1h30 | | | | | 100 % | 1 | < 05/20 |
| | Initiation à la rédaction d'un mémoire en architecture | 22h30 | | 1h30 | | | | | 100 % | 2 | < 05/20 |
| **TRI 9** | Séminaire sur l'actualité architecturale | 45h | | 3h | | | | | 100 % | 1 | < 05/20 |
| **PI 9** | Stage professionnel | 90h | | | | | 6h | 100 % | | 2 | < 05/20 |
| Total | | **405 h** | **12h** | **7h30** | **1h30** | | **6h** | | | **16** | |

## 10. Semester 10 :

| Nature of the Course Content | Course Title | **VHS** | Weekly Hours | | | | | Mode of Assessment | | **Coefficient** | Eliminatory Grade |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Studio | Lecture | Tutorial | Practical Work | Internship | Continu | Examen | | |
| FI 10 | Final Year Project | 180h | Studio | | | | | 100 % | | 10 | < 10/20 |
| | Final Year Dissertation | 45h | Studio | | | | | 100 % | | 6 | < 07/20 |
| Total | | **225h** | **15h** | | | | | | | **16** | |

# Training-Related Instruction
# Professional Internship

## Overall Summary of the Training Program

| UI / VH | FI | AI | TRI | Site Visit / Internship | Total |
|---|---|---|---|---|---|
| Studio | 1845 | 0 | 0 | 0 | 1845 |
| Lecture | 382h30 | 540 | 315 | 0 | 1237h30 |
| Tutoriao | 157h30 | 360 | 112h30 | 0 | 630 |
| Pratical work | 0 | 202h30 | 0 | 0 | 202h30 |
| Internship | 0 | 0 | 0 | 270 | 270 |
| Self-Directed Work | | | | | |
| **Total** | **2385** | **1102h30** | **427h30** | **270** | **4185** |

## Overall Summary

## Distribution of Contact Hours by Type of Instruction and Semester

| | Studio H | Lecture H | Tutorial H | Pratical work H | Site Visit / Internship H | Total H |
|---|---|---|---|---|---|---|
| **S1** | 180 | 112h30 | 90 | 22h30 | 15 | 420 |
| **S2** | 180 | 112h30 | 90 | 22h30 | 15 | 420 |
| **S3** | 180 | 157h30 | 90 | 22h30 | 15 | 465 |
| **S4** | 180 | 157h30 | 90 | 22h30 | 15 | 465 |
| **S5** | 180 | 135 | 67h30 | 45 | 30 | 457h30 |
| **S6** | 180 | 135 | 67h30 | 45 | 30 | 457h30 |
| **S7** | 180 | 157h30 | 67h30 | 0 | 30 | 435 |
| **S8** | 180 | 136.5 | 45 | 22h30 | 30 | 414 |
| **S9** | 180 | 112h30 | 22h30 | 0 | 90 | 405 |
| **S10** | 225 | 0 | 0 | 0 | 0 | 225 |
| **Total** | **1845** | **1237h30** | **630** | **202h30** | **270** | **4185** |

**Semester 1**
**Teaching Unit**: EF 1
**Subject**: Project Studio 1

**Coefficient**: 4
**Eliminatory Grade**: Grade below 10/20

## GENERAL OBJECTIVES OF THE SUBJECT MATTER

The first semester marks the beginning of the academic training and introduces students to the field of architecture, its language, tools, and representational techniques. Discovering architecture also involves learning how to observe, analyze, and interpret architectural projects in terms of their form and composition.

This discovery process unfolds in three stages:

- **Discovery**: The work focuses on geometry, two-dimensional shapes, volumes, artistic expression, their properties and characteristics, as well as various representational techniques, such as technical drawing, sketching, model-making, etc.
- **Composition**: This stage involves the manipulation of forms and volumes. The primary objective is to acquire and master the vocabulary of composition and spatial organization, including the different transformations that can be applied to shapes and volumes.
- **Decomposition**: Through the geometric analysis of an architectural project, this stage aims at reading a concrete project in terms of its formal structure. This phase synthesizes the semester's learning outcomes by applying them to a case study, facilitating a smooth transition to the second semester (S2).

## COURSE CONTENT

The studio serves as a multidisciplinary teaching platform that incorporates various instructional methods, including lectures, short and long exercises, model-making, reading and summarizing architectural works, among others. However, two complementary types of exercises can be distinguished and are conducted in parallel:

a. Long exercises focused on composition and decomposition themes
b. Short exercises related to drawing, composition concepts, etc.

### Long Exercises

**Theme 01: Two-Dimensional Geometric Composition**
This exercise aims to help students acquire and apply the rules of composition and spatial organization. Students are introduced to geometric forms, how to draw them, their geometric properties, and the various modes of combination and arrangement.

The exercise also introduces color and texture, allowing compositions to include more parameters (tones, weight, balance, etc.).
Collage-based composition is also employed to introduce concepts of depth and positioning (superposition, foreground, background, etc.).

**Theme 02: Thoughtful Volumetric Composition**
Building on the organizational concepts introduced in the previous theme, this unit delves into three-dimensional design. The objective is to stimulate creativity and enhance students' sensitivity to scale and proportion through volume manipulation.

Students are tasked with creating a thoughtful volumetric composition guided by specific constraints (organization principles, two-dimensional composition, general view or layout). Regardless of the approach, the goal remains the mastery of transitioning from two-dimensional geometric elements (point, line, plane) to volumetric elements (vertex, edge, face/surface, volume).

At this stage, the following are also addressed:

- Transformations of volumes
- Model construction and manipulation
- Orthographic projection for volume representation
- Artistic expression through the choice of color, texture, and materials

**Theme 03: Reading an Architectural Work**
While the previous themes establish a foundation in geometric composition, they are carried out in abstract settings. This theme offers the opportunity to apply acquired knowledge to a real-world case study—an architectural project. The aim is to initiate students into reading and understanding planar and volumetric elements within a renowned architectural work. A secondary objective is to introduce students to influential architects and their creations.

The instructor provides a selection of architectural works from which students choose one as the basis for a three-part analysis:

- Decomposition of plans and facades into two-dimensional geometric forms
- Interpretation of relationships and arrangements among forms
- Identification of compositional principles and rules adopted by the architect

**Short Exercises**

Short exercises are primarily focused on drawing and are organized according to the following themes:

**Theme 01: Instruments and Tools**

- *General Concepts*: Definition of drawing and its types (sketch, preliminary sketch, diagram, study, perspectives, axonometric views, survey drawings, etc.); drawing instruments: types of pencils and their differences, their roles and usage, line thickness, sharpness, tonal variations
- *Paper*: Standard formats, types, weights, layout, framing, title block

- *Standardized Writing*: Letter height, width, and spacing; font types, placement, alignment, and standards

Each session includes exercises aligned with a specific objective, progressing in complexity and difficulty. Initial exercises involve replicating lines and patterns (square, triangular, and composite grids), focusing on distinguishing line types using different pencils to explore thickness and tone.

**Theme 02: Shape, Proportions, and Scale**

- *Line Types*: Nature, thickness, and meanings; parallel and perpendicular lines, angles, dividing lines for drawing regular and irregular polygons: equilateral triangle, square, pentagon, hexagon, octagon, rectangle, trapezoid, parallelogram, rhombus, ellipses, ovals, and spirals
- *Scales*: Graphical representation of scales; graphic and numeric scales, calculation and conversion, metric and imperial units. Shape drawing may involve reproducing complex patterns or grids from which students identify geometric forms and understand their interrelationships, especially with circles.

Work on scale includes reproducing dimensioned drawings to scale or performing scaling-up and reproduction exercises using graphic scales or measurable reference points on graphic documents (plans, sections, or elevations).

**Semester 1**
**Teaching Unit**: EF 1
**Subject**: History of Architecture 1

**Coefficient**: 2
**Eliminatory Grade**: Grade below 07/20

## GENERAL OBJECTIVES OF THE COURSE

The history of architecture is the study of the art of building as it has evolved over time, in relation to diverse cultural areas and across various historical and civilizational eras. It encompasses the history of habitation, buildings, construction techniques, architectural design, and architects themselves.

The chronologically progressive approach adopted in this course, alongside the use of comparisons across time and space, enables students to assess the significance of **context**—in its broadest sense—in the evolution of architecture, while identifying influences, continuities, and ruptures throughout history.

The teaching of architectural history aims to:

- Understand the material translation of the human spirit in the field of architecture and how it has evolved over time.
- Acquire foundational knowledge of architectural culture.
- Build a repertoire of ideas and references to inspire creativity.
- Learn to “read between the stones” and develop critical thinking skills.

## COURSE CONTENT

- Prehistory and the earliest shelters
- Mesopotamian architecture
- Egyptian architecture
- Greek architecture
- Roman architecture
- Early Christian and Byzantine architecture
- Romanesque and Gothic architecture

**Semester 1**
**Teaching Unit**: EF 1
**Subject**: Project Theory 1

**Coefficient**: 2
**Eliminatory Grade**: Grade below 07/20

## GENERAL OBJECTIVES OF THE COURSE

- To define architecture and its disciplinary scope;
- To acquire the foundational principles of architectural composition;
- To become familiar with the architectural language;
- To develop introductory skills in reading and understanding architectural space.

## COURSE CONTENT

**Architectural Composition** :

- Two-dimensional geometric forms: properties and interpretations;
- Laws of visual perception and principles of coherence;
- Composition rules and modes of formal association;
- Volumes: properties, interpretations, and various methods of form generation and transformation;
- Materiality: the role of color and texture in composition.

**Introduction to the Architectural Profession**:

- The role and responsibilities of the architect;
- Various modes of architectural representation and communication.

**Semester 1**
**Teaching Unit**: EA 1
**Subject**: Spatial Geometry 1

**Coefficient**: 2
**Eliminatory Grade**: Grade below 05/20

## GENERAL OBJECTIVES OF THE COURSE

The subject *"Spatial Geometry 1"* introduces and prepares students for the graphical representation of buildings in space. This course aims to develop familiarity with the transition between two-dimensional (2D) and three-dimensional (3D) representations, thereby cultivating the ability to visualize and interpret spatial forms.

## COURSE CONTENT

The program will cover the following concepts:

- Methods of projection ;
- Representation of points, lines, and planes;
- Intersections involving lines, planes, and volumes;
- Rotation (rabattement) and affinity transformations ;
- Representation of circles, cones, cylinders, and spheres;
- Perspective drawing methods;
- Axonometric representation methods;
- Shadow projection techniques.

## Semester: 1

## Teaching Unit: EA 1

## Course Title: *Construction Materials Technology 1 (TMC 1)*

## Coefficient: 2

## Eliminatory Grade: Below 05/20

## General Course Objectives

This course aims to equip students with the ability to select appropriate construction materials based on their inherent properties. Emphasis is placed on ensuring coherence, safety, sustainability, and cost-efficiency in material selection. Additionally, students will develop an understanding of the diversity of materials used in the building sector and their specific applications.

## Course Content Overview

### 1. Introduction

- 1.1 General Concepts
- 1.2 The Architect and Building Materials
- 1.3 Classification of Materials
- 1.4 Main Properties of Construction Materials:
  - Physical Properties
  - Mechanical Properties
  - Chemical Properties

### 2. Cements

- 2.1 Introduction
- 2.2 Principles of Portland Cement Manufacture
- 2.3 Main Constituents and Additives
- 2.4 Main Categories of Cement

### 3. Lime

- 3.1 Definition
- 3.2 Manufacturing Process
- 3.3 Properties
- 3.4 Applications
- 3.5 Practical Guidelines
- 3.6 Differences Between Cement and Lime

**4. Plaster**

- 4.1 Definition
- 4.2 Classification
- 4.3 Manufacturing Process (From Raw Material to Finished Product)
- 4.4 Properties
- 4.5 Applications

**5. Aggregates**

- 5.1 Definitions
- 5.2 Sources
- 5.3 Classification
- 5.4 Properties
- 5.5 Sand Purity Assessment (Sand Equivalent Test)
- 5.6 Fields of Application

**6. Mixing Water**

- 6.1 Definition
- 6.2 Role in Mix Preparation
- 6.3 Quality Standards
- 6.4 Physical and Chemical Characteristics
- 6.5 Effects of Excess or Insufficient Water

**7. Mortars**

- 7.1 Definition
- 7.2 Composition and Production
- 7.3 Implementation and Application
- 7.4 Qualities of a Good Mortar

## Practical Work & Assessment

Laboratory sessions are designed to introduce students to real-world construction materials and processes. These sessions include:

- **Mini-Project:** Comparative study of two binders (e.g., cement vs. lime)
- **Short Quizzes:** Written and oral assessments to reinforce theoretical knowledge
- **Course Summaries:** Concise student-prepared summaries of lectures

## Teaching Unit: EA 1

## Course Title: *Mathematics*

**Coefficient:** 2
**Eliminatory Grade:** Below 05/20

### General Course Objectives

This course aims to reestablish the fundamental role of mathematics, particularly geometry, in the architectural education of students. The program provides foundational tools necessary for formulating, representing, and calculating forms and spaces that students envision during their design processes.

### Course Content

- Core theorems in Euclidean geometry
- Review of trigonometry and coordinate systems in 2D and 3D
- Concepts of distance
- Metric properties of basic geometric figures and their applications
- Geometry and vector calculus, including barycenters
- Differential equations
- Integrals: single, double, and triple integrals
- Scalar product, vector product, and mixed product with applications
- Geometry of sunlight and solar orientation
- Fundamental concepts in astronomy
- Construction of solar charts and diagrams for specific dates and locations
- Interpreting sunlight duration
- Construction of shadows on horizontal, vertical, and inclined planes
- Construction of solar contour curves
- Application of solar data in design projects

### References & Bibliography


- Goldstein, Catherine, "On Some Practices of Mathematical Information," *Philosophia Scientiæ*, 5.2 (2001), pp. 125–160.
- Mattelart, Armand, *History of the Information Society*. Paris: Éditions de la Découverte, 2000.
- Gispert, Hélène, "Scientific Journals in Europe," in *Europe of the Sciences*, Blay & Nicolaïdis (eds.), Paris: Seuil, 2001, pp. 191–211.

## Teaching Unit: ERF 1

## Course Title: *Oral Communication Skills*

**Coefficient:** 1
**Eliminatory Grade:** Below 05/20

### General Course Objectives

This course enables students to develop oral communication skills, improve articulation, and boost self-confidence. The focus is on acquiring tested techniques for delivering both prepared and improvised oral presentations. Students also evaluate peer presentations and incorporate information and communication technologies into their work. These competencies are essential for presenting architectural projects and for success in future professional environments.

### Specific Objectives

- Understand the basic rules of communication
- Effectively convey messages orally
- Manage public speaking anxiety and stress
- Apply various oral expression techniques
- Handle objections and challenging situations

### Course Content

### A. Communication Fundamentals

- Specificities of speeches, conferences, and debates
- Different meeting types: team, informational, decision-making, creative
- Structuring effective arguments for persuasion
- Organizing thoughts based on audience and objective

### B. Effective Speech Delivery (Verbal)

- Structuring: introduction, body, conclusion
- Word choice and clarity; use of silence
- Types of arguments: deductive, analogical

### C. Mastering Body Language

- Non-verbal and paraverbal communication
- Gestures, posture, spatial presence
- Facial expressions and eye contact

### D. Managing Public Speaking Anxiety

- Understanding causes of stage fright
- Techniques for self-regulation and confidence
- Breathing techniques and vocal modulation

**E. Audience Interaction**

- Active listening and reformulation
- Handling difficult questions and criticism
- Empathy and group dynamics

**Teaching & Learning Strategies**

- Guided and independent video analysis
- Pair and group work, simulations, brainstorming
- Prepared and impromptu speeches
- Peer teaching, improvisation, role-playing

**Assessment Exercises**

- Group reflections and practical exercises
- Role-play scenarios applying learned techniques
- Professional oral presentation simulations

## Teaching Unit: SD1

## Course Title: *Urban Discovery Visits (including Historical Sites)*

**Coefficient:** 1
**Eliminatory Grade:** Below 05/20

### General Course Objective

To explore, describe, and visually represent urban and architectural components of the city, including historical and archaeological sites.

### Specific Objectives

- Introduce architectural and urban vocabulary
- Develop architectural cultural awareness
- Gain basic observational and artistic representation skills (sketching, freehand drawing, photography)
- Practice verbal and written description

### Course Content

- Guided site visits in chronological order: Phoenician, Roman, Byzantine, Ottoman, colonial urban settlements, and contemporary Algerian achievements
- Activities: observation, sketching, photography, verbal and written description of visited elements

**Assessment:**
Each visit is documented in a well-written report (10–15 pages), including photographs. The report is submitted in both printed (A4) and digital formats to the course instructor.

**FIRST YEAR PROGRAM: SEMESTER 2**

**Semester 2**
**Teaching Unit**: EF2
**Course Title**: Project Workshop 2
**Coefficient**: 4
**Eliminatory Grade**: Any grade below 10/20

## GENERAL OBJECTIVES OF THE COURSE

Semester 2 builds upon the knowledge acquired during the previous semester. Its main objective is to transition from abstract theory to practical application through real case studies. This allows students to connect theoretical knowledge (geometry, forms, organizational principles, artistic dimension) with practical skills (façade composition, spatial composition). This practical phase is complemented by technical drawing, which includes representations of staircases and other vertical circulation elements, sections, contour lines, topographic profiles, and more.

The progressive shift towards practical discovery unfolds in three stages:

- **Analyze**: Analysis plays a crucial role at this stage of architectural education. It allows students to become familiar with architecture and its scale, and to apply the knowledge acquired in the previous semester to concrete examples. Analysis may focus on façades or plans and should not be limited to form and geometry but should also consider usage, space, function, and other aspects. In-depth analysis is essential for a comprehensive understanding of architectural works.
- **Compose**: Composition is a key step in architectural learning, as it allows students to design a part of a project for the first time in their studies. The façade remains the most suitable medium for composition exercises, as it facilitates a smooth transition from abstract composition concepts to architectural composition. Other exercises may also fulfill this objective by offering varied approaches to architectural composition.
- **Design**: The project phase is critical in architectural education. Beyond geometric considerations, students learn to account for function, usage, ergonomics, materials, atmospheres, and other spatial factors. This stage enables students to synthesize all acquired knowledge and apply it in the design of an architectural project. It represents the culmination of an entire year of learning through the realization of a project.

## COURSE CONTENT

The workshop is a versatile course that utilizes various teaching methods: lectures, long and short exercises, model-making, readings and synthesis of reference works, etc. However, two types of exercises can be distinguished, carried out simultaneously and complementarily:

a) Long exercises focused on themes of composition and decomposition
b) Short exercises related to drawing and composition principles

The course is structured around three long exercises:

**Theme 01: Façade Composition**

- Introduction to the concept of the façade and its role in architecture
- Introduction to different types of façades: curtain wall, ventilated façade, double-skin façade, etc.
- Analysis of façade components: windows, doors, balconies, loggias, etc.
- Study of façade composition principles: proportions, rhythm, balance, etc.
- Practical exercises in façade analysis and composition

The practical exercise consists of proposing façade designs corresponding to provided collective housing unit plans. In this task, students are exempt from spatial analysis, allowing them to focus on the correspondence between the plan and façade and the application of architectural composition principles. This exercise enhances students' creativity and problem-solving skills by encouraging them to propose functional and aesthetically pleasing architectural solutions.

**Theme 02: Spatial Analysis of an Architectural Work**

- Introduction to spatial analysis and its importance in understanding architecture
- Study of different types of architectural spaces: public, private, semi-public, indoor, outdoor, etc.
- Analysis of spatial composition principles: organization of spaces and circulation, served/servant spaces, spatial boundaries, etc.

The objective of this phase is to go beyond mere geometric composition and focus on spatial analysis of an architectural work. Students are introduced to the importance of spatiality in architectural design by examining various spatial configurations, boundaries, and environmental interactions.
This stage requires a deep reading of architectural space, followed by a synthesis of the analysis through graphic representations such as diagrams or flowcharts.

**Theme 03: Project Design (Spatial Composition)**

- Introduction to architectural design and the concept of the project
- Analysis of site constraints: topography, orientation, urban context, etc.
- Study of spatial composition principles as applied to project design: organization of spaces, circulation, functions, etc.
- Development of a program aligning use/user, activity/need, function/furniture/space/ergonomics

The end-of-semester project must be manageable for first-year students in terms of surface area and project topic. Therefore, the project scale must be limited so students can work effectively while applying concepts of ergonomics, space utilization, furniture layout, and more. The residential function is particularly appropriate for this exercise, as students are familiar with the needs of space users.

It is essential to address the close relationship between the project and its context. Thus, it is imperative to analyze concepts such as topography, site morphology, orientation, landscape views, and accessibility. Site integration should not be limited to topography but must also consider climatic or geographical constraints such as existing on-site materials and the mineral and vegetal cover.

**In summary**, the objective of this exercise is to enable students to put into practice all the knowledge acquired throughout the year and to create a project that integrates harmoniously into its context while meeting the needs of space users.

**Semester 2**

**Teaching Unit**: EF2
**Course Title**: History of Architecture 2
**Coefficient**: 2
**Eliminatory Grade**: Any grade below 07/20

## GENERAL OBJECTIVES OF THE COURSE

- To establish a historical foundation of architectural knowledge related to the Muslim world through a corpus illustrating the architectural production of major dynasties.
- To gain knowledge of the principal dynasties—central, unifying, and local—and their respective geographical distributions.
- To understand the foundations of architecture in Muslim-majority or Muslim-minority territories, highlighting both diversity and specificity.
- To identify the typological, stylistic, and technical architectural characteristics specific to the main dynasties.
- To acquire a foundational vocabulary and conceptual framework related to the architectural and urban lexicon within the historical context of the Muslim world.

## COURSE CONTENT

**From the Birth of Islam to the Fall of the Ottoman Empire**

- The advent of Islam and the political, economic, and cultural context of the Arabian Peninsula.
- Early Islamic architecture (610–661).
- Architecture of the central dynasties.
- Architecture during the Umayyad period (661–750).
- Architecture during the Abbasid period (750–945).

**Architecture of Unifying and Local Muslim Dynasties**

- The fragmentation of the Abbasid Caliphate and the emergence of unifying and local Muslim dynasties in both the East and the West.

**Architecture of the Unifying Dynasties in the Western Islamic World**:

- Fatimid, Almohad, and Almoravid dynasties.

**Architecture of Selected Local Dynasties in the Western Islamic World**:

- Umayyads of Spain, Idrisids, Marinids; Aghlabids and Hafsids, Ayyubids and Mamluks.

**Architecture of Selected Local Dynasties in the Eastern Islamic World**:

- Safavids in Iran and China, Mughals in India, Ottomans in Turkey.

**Architecture of Major Muslim Dynasties in Algeria**:

- Rustamids, Zirids, Ziyanids, and Ottomans.

**Semester 2**
**Teaching Unit**: EF2
**Course Title**: Project Theory 2
**Coefficient**: 2
**Eliminatory Grade**: Any grade below 07/20

## GENERAL OBJECTIVES OF THE COURSE

- To introduce the architectural project through Vitruvius's tripartite framework: utility, firmness, and beauty.
- To acquire foundational knowledge for interpreting architectural space and its components (form, structure, function).
- To study the interaction and interdependence of the triptych—form, function, and structure—in the architectural design process.

## COURSE CONTENT

### Study of the "Beauty" Component in Architectural Design

- The façade: as envelope and cladding, analyzed in parallel with the studio exercise on "façade composition."

### Introduction to Architectural Space

- Definition and spatial boundaries through horizontal and vertical elements.
- Spatial relationships, spatial organization, and spatial qualities.
- Analysis of case studies.

### Introduction to Project Shaping

- Proportion systems and scale relationships.
- Dimensional coordination and its implications in design.
- Basic concepts of programming and the functional aspects of architectural space.
- Fundamental notions of atmosphere and perception (acoustics, lighting, views, etc.).

### Design Process: Its Scales and Stages of Interest

### Relationships Between Form, Space, and Structure

- Introduction to structural systems.
- Types of structural systems in architecture (infrastructure, superstructure, roofing systems, tensile structures, etc.).
- Study of the relationships among material, structure, form, function, and space.

**Semester 2**
**Teaching Unit**: EA2
**Course Title**: Spatial Geometry 2
**Coefficient**: 2
**Eliminatory Grade**: Any grade below 05/20

## GENERAL OBJECTIVES OF THE COURSE

To apply the knowledge acquired in the first semester to the representation of polyhedra and surfaces of revolution, enabling the translation of complex volumes, their intersections, and the resulting shadow effects into two-dimensional drawings.

## COURSE CONTENT

- **Concept of Polyhedra**: Definition and classification (regular polyhedra, sections and developments, symmetry elements, topological properties).
- **Surfaces of Revolution**: Conical, cylindrical, and spherical surfaces; their representation, sectioning, development, self-cast and cast shadows.
- **Surface Development**: Determination and construction of surface developments.
- **Intersection of Two Surfaces**: Types of intersections, construction methods, and intersection lines.
- **Perspective**.

**Semester 2**
**Teaching Unit**: EA2
**Course Title**: Construction Materials Technology 2 (CMT 2)
**Coefficient**: 2
**Eliminatory Grade**: Any grade below 05/20

## GENERAL OBJECTIVES OF THE COURSE

To master the selection of construction materials. The student will explore the practical applications of theoretical concepts acquired during lectures.

## COURSE CONTENT

### Concrete

- Introduction
- Concrete manufacturing
- Concrete implementation
- Qualities of good concrete
- Reinforced concrete
- Prestressed concrete

### Building Stones

- Definition
- Masonry using natural stone
- General principles of execution
- Ashlar masonry
- Masonry bonding and arrangement

### Wood

- General overview and classification
- Physical properties
- Traditional wood products
- Types of joints and assemblies

### Ceramic Products

- General characteristics
- Properties and applications
- Different types of bricks (solid and hollow)
- Masonry patterns and bonding
- Various types of roof tiles
- Ceramic finishes and coatings

**Insulating Materials**

- Overview
- Structure and classification
- Thermal insulation
- Acoustic insulation

**Glass**

- Definition
- History of glass
- Properties of glass
- Use of glass in construction

**Sustainable Materials**

- New materials (bio-based, polymers, etc.)
- Traditional materials

**Semester 2**
**Teaching Unit**: EA2
**Course Title**: Building Physics
**Coefficient**: 2
**Eliminatory Grade**: Any grade below 05/20

## GENERAL OBJECTIVES OF THE COURSE

This course provides a foundational understanding of the static behavior of buildings. It enables students to master the principles of equilibrium in simple bodies. The primary learning objectives include:

1. Preparing students for technical subjects and familiarizing them with the language and methods used in engineering.
2. Developing logical reasoning in interpreting physical phenomena related to buildings.

The knowledge acquired serves as an essential basis for understanding how buildings and their systems behave in various contexts. Beyond the comprehension of physical phenomena directly or indirectly related to construction, the course targets the following key objectives:

## COURSE CONTENT

### I. Statics I – Introduction

- Mechanics
- Newton’s Laws
- Fundamentals of Statics

### II. Conditions of Equilibrium

- Translational Equilibrium
- Rotational Equilibrium

### III. Forces

- Definitions
- Concurrent and Non-concurrent Forces
- Point Loads and Distributed Loads
- Moments of Forces

### IV. Nature of Forces

- Gravitation
- Weight and Mass
- Center of Gravity / Center of Mass

- Discrete and Continuous Material Systems
- Contact Forces and Support Reactions

**V. Building Thermal Physics / Heat Transfer**

- Introduction to Thermal Phenomena
- Conduction, Convection, Radiation
- Heat Flux
- Thermal Resistance
- Overall Heat Loss
- Heat Flux Density
- Heat, Temperature, Laws of Heat Transfer
- Heat Loss Calculations

**VI. Lighting – Solar Geometry**

- Seasons and Solar Exposure
- Solar Path and Positioning
- Solar Radiation
- Light and its Interaction with Materials
- Photometry
- Light-Material Interaction

**VII. Acoustics**

- Introduction to Acoustics
- Physical and Physiological Aspects of Sound
    - Sound Waves
    - Acoustic Pressure
    - Physical Sound Levels
    - Sound Transmission, Reflection, and Absorption
- Applications in Architecture:
    - Reverberation
    - Basic and Standardized Acoustic Insulation (dB, DnT)
    - Sound Reduction Index (R)
    - Relationship between R and dB

    - Mass Law Equations

**VIII. Fluids**

- Hydrostatics: Pascal's and Archimedes' Theorems
- Hydrodynamics: Bernoulli's Theorem
- Flow Laws and Types of Fluid Flow

**IX. Electricity**

- Electric Current
- Ohm's Law
- Kirchhoff's Theorems
- Electrical Energy
- Electrical Power

**Semester 2**
**Teaching Unit**: ER2
**Course Title**: Written Expression
**Coefficient**: 1
**Eliminatory Grade**: Any grade below 05/20

## GENERAL OBJECTIVES OF THE COURSE

This course aims to help undergraduate and first-year students improve and standardize their written expression skills.

## COURSE CONTENT

1. **Time Management**
    - Using an agenda
    - Scheduling study sessions and revision plans
2. **Referencing**
    - Strengths and limitations of using the Internet for research
    - Understanding bibliographic references
    - Awareness of issues such as copy-paste practices, plagiarism, and paraphrasing
3. **Essay Writing**
    - Problem formulation (developing a set of questions that frame the topic)
    - Developing a detailed outline (organizing logical reasoning)
    - Writing and structuring ideas effectively, including the creation of titles and subtitles
4. **Note-taking**
    - General principles
    - Note-taking techniques
    - Application through oral and written communication contexts
5. **Document Summarization**
    - Summarizing an article or dossier concisely, clearly, accurately, and effectively
    - Techniques for efficient and rapid reading
    - Practical exercises using selected texts
6. **Oral Presentations**
    - Gathering and selecting relevant information
    - Preparing written, visual, or audiovisual aids
    - Structuring and formatting the presentation content

**Semester 2**
**Teaching Unit**: Discovery Internship 2 (SD 2)
**Course Title**: Exploratory Visits of the City (including Historical Sites) and its Components
**Coefficient**: 1
**Eliminatory Grade**: Any grade below 05/20

## GENERAL OBJECTIVES OF THE COURSE

- To discover, describe, and represent architecture, the city, and its components (including ancient sites).

## SPECIFIC OBJECTIVES OF THE COURSE

- To introduce students to the language of architecture, urban environments, and their components.
- To acquire foundational architectural culture.
- To develop basic skills specific to observation and artistic representation (sketching, freehand drawing, and photography).
- To initiate students into verbal and written architectural description.

## COURSE CONTENT

- Guided visits to sites (in chronological order): ancient Phoenician sites, Roman archaeological sites, Byzantine remains, historic medinas, Ottoman-era sites, human settlements from the colonial period, and examples of contemporary architecture in Algeria.
- During these outings, students are expected to observe, sketch, photograph, and describe (both verbally and in writing) the elements visited.

The first-year “Visits and Discoveries” program is assessed through:

- A well-developed report (for each visit) written in the form of a 10–15 page document, including photographs. The report must be submitted in printed A4 format along with a digital copy, both to be handed in to the instructor in charge of the course.

**SECOND YEAR PROGRAM: SEMESTER 3**

**Semester 3**
**Teaching Unit**: EF3
**Course Title**: Design Studio 3
**Coefficient**: 4
**Eliminatory Grade**: Any grade below 10/20

## GENERAL OBJECTIVES OF THE COURSE

This semester is dedicated to the study and integration of an architectural project within its general context, taking into account physical, environmental, and socio-cultural determinants from a sustainability perspective:

- Topography
- Climate
- Built and unbuilt environment (sensitive surroundings)
- Local uses and practices

## COURSE CONTENT

Given that integration and comfort requirements vary greatly depending on the building's function, a variety of building types (e.g., library, museum, restaurant) should be distributed among student groups to promote mutual enrichment. The semester is structured into three major phases: a theoretical acquisition phase, a contextual analysis phase, and an architectural design phase. It is essential to maintain a continuous and practical link between analysis and design.

- **Theoretical acquisition**, complementing the "Project Theory" course, involves student group work on case studies from Algeria and abroad that address issues of context and comfort, with a preference for basic and ecological materials.
- **Contextual analysis**: Through concrete examples, students will observe and evaluate how different comfort and site parameters, when shaped through architectural design, influence spatial use.
- **Application**: Implementation through either two separate design projects or one comprehensive project to synthesize the learning outcomes from the previous two phases.

**Semester 3**
**Teaching Unit**: EF3
**Course Title**: History of Architecture 3
**Coefficient**: 2
**Eliminatory Grade**: Any grade below 07/20

## GENERAL OBJECTIVES OF THE COURSE

This course covers the chronological span beginning with the Enlightenment and the emergence of rationalism, focusing primarily on the architectural developments of the 18th and 19th centuries. The main objective is to understand the significant contributions of philosophy and technological advances to architecture.

On one hand, the course examines rationalism and the emergence of new aesthetic values that diverge from Vitruvian principles. On the other hand, it explores the impact of the Industrial Revolution—not only in terms of technology (materials, industrialization, standardization), but also in terms of its social implications, including the development of workers' housing and the hygienist movement.

The technological leap brought by the Industrial Revolution also influenced the arts, moving them away from figurative and romantic styles toward abstraction. Students should be able to recognize the parallel and corresponding transformation in architecture, particularly with the rise of the Modern Movement.

## COURSE CONTENT

- Renaissance architecture
- Baroque architecture
- Rationalism and the utopian thinkers of the 17th century
    - The influence of philosophy
    - The teachings of Blondel
    - The visions of Boulée and Ledoux
- The Industrial Revolution
- Neoclassicism
- Historicism and eclecticism
- Avant-garde architecture:
    - Art Nouveau
    - The Chicago School
- Reinforced concrete:
    - The role of the material in architecture
    - The work of Pier Luigi Nervi
    - Introduction to modern concrete applications

**Semester 3**
**Teaching Unit**: EF3
**Course Title**: Project Theory 03
**Coefficient**: 2
**Eliminatory Grade**: Any grade below 07/20

## GENERAL OBJECTIVES OF THE COURSE

The course is primarily devoted to acquiring tools and methods of architectural design, where architecture is considered not as an isolated object but within its physical, social, and cultural context. It aims to raise second-year students' awareness of the realities of architectural production and the dualities they will face in their future profession. The course emphasizes understanding the dialectic between site and project, container and content, spaces and uses—focusing particularly on site perception criteria, morphology, and both natural and anthropogenic physical factors (such as sunlight, wind, precipitation, natural and urban landscapes). It also addresses how to engage with the environment to develop an architectural project that ensures user comfort and well-being.

## COURSE CONTENT

**• Site Analysis Methods for Construction Projects**
**A. Urban Environment**

1. Definition of key concepts: neighborhood, neighborhood unit, residential cluster, etc.
2. Urban regulations and planning tools (e.g., PDAU, POS).
3. Issues, necessities, and components of urban analysis.

**B. Climatic Environment**

1. Study of climatic data: solar geometry; wind types and their effects based on site geomorphology; wind behavior in relation to built forms.

**C. Natural Environment**

1. Visual approach to context
2. Natural terrain morphology
3. Vegetation
4. Hydrography

**D. Built Environment**

1. Analysis of building height profiles, solid/void ratios, skyline.

2. Façade analysis based on: window placement; grid system; ratio of glazed to opaque surfaces; horizontal/vertical emphasis; composition and rhythm (geometric rules); texture and construction materials.

**• Site and Site Integration**

**A. The Site**

1. Definition of the concept of "site."
2. Perception of a natural site: silhouettes; contours; textures; groupings; views, focal points, and landmarks; sunlight and natural lighting; shading and view obstructions (masking effect); natural ventilation; vegetation as a heat regulator or windbreak, etc.

**B. Site Integration (Relationship between Building and Environment)**

1. Definitions of various integration types: functional, socio-cultural, morphological, etc.
2. Different architectural attitudes toward the built environment: pastiche, mimicry, reference, analogy, opposition, etc.

**C. Incorporation into the Terrain**

1. Topographic relief and section cuts.
2. Types of site placement on sloped terrain and slope stabilization methods.
3. Earthwork and grading techniques.

## Semester 3

**Teaching Unit**: EA3
**Subject**: Construction 1
**Coefficient**: 2
**Eliminatory Grade**: Any score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

This course aims to introduce students to the fundamental concepts of structural systems and building stability. It seeks to familiarize them with the basic vocabulary and essential knowledge related to construction methods, earthworks, and construction materials.

## COURSE CONTENT

- **Topographic methods**: measurements of planimetry and altimetry, overview of the various instruments used.
- **Types of excavations and earthwork methods**.
- **Excavation slope stabilization and shoring**: safety measures during excavation processes.
- **Soil compaction and reinforcement techniques**.
- **Basic concepts in geotechnics and soil investigation**.
- **Adaptation to soil conditions**: definition, functions, and components of foundations.
- **Types of foundations**:
    - Shallow foundations (isolated, strip, and raft foundations).
    - Deep foundations (wells, piles, etc.).
- **Pre-dimensioning and associated elements**: utility networks, ground beams, foundation walls.
- **Different structural systems**.
- **Structural components of a building**:
    - Load-bearing elements (columns, load-bearing walls).
    - Spanning elements (beams, floors, stairs).
- **Role, stress, and deformation of primary structural elements**.
- **Roofing elements**.

**Semester 3**
**Teaching Unit**: EA3
**Subject**: Strength of Materials 1 (SOM 1)
**Coefficient**: 2
**Eliminatory Grade**: Any score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

The main objective of the Strength of Materials (SOM) course in architectural training is to enable students to understand the behavior of the structural system that will support their design, regardless of the materials used. The course aims to develop comprehension of the physical phenomena involved (force, equilibrium, stress, resistance, deformation, etc.) and their implications (material selection, geometry of elements and their cross-sections, types of connections).
Strength of Materials, as taught to second-year students, serves as a foundational course for subsequent structural modules in later years.

## COURSE CONTENT

- Forces – Moments – Actions
- Principles – Representation of forces, moments, and displacements
- Equilibrium
- Structural elements
- Types of supports
- Beam analysis
- Internal force diagrams (bending moment, shear force, and axial force) in beams
- Introduction to stress concepts
- Mechanical properties of materials

**Semester 3**
**Teaching Unit**: EA3
**Subject**: Computer-Aided Design (CAD)
**Coefficient**: 2
**Eliminatory Grade**: Any score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

The aim of this course is to provide students with practical experience in using an interactive tool that offers architects a range of 2D and 3D manipulation capabilities, enabling rapid verification of conceptual design choices.
The course also aims to build an understanding of the methodological differences between prototyping tools and production tools as means of supporting the design process.

## COURSE CONTENT

- Introduction to CAD software (general overview, command syntax, entity properties)
- Drawing commands (precision tools, layers, text, dimensions, graphical elements)
- Editing commands (selection, selection modes, parameters, etc.)

**Semester 3**
**Teaching Unit**: ERF 3
**Subject**: Spatial Analysis and Cartography
**Coefficient**: 1
**Eliminatory Grade**: Any score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

This course aims to describe and explain spatial organization by analyzing and defining the physical and human characteristics of places, establishing links between territories and their various components, regardless of their nature. In a second phase, space is considered as the result of interactions between different stakeholders.

## COURSE CONTENT

This course is primarily delivered through practical or guided work sessions, with theoretical concepts briefly introduced at the beginning of each session. The course is structured around two main axes:

### 1. Physical Characteristics

Interpretation and analysis of the physical environment based on the site's physical features. Students are expected to learn how to interpret preliminary data through proper reading of topographic maps, developing their observational skills to describe and locate the site in detail, appreciating it from multiple perspectives—such as topographic profiles, morphological types of relief, climate, temperature, precipitation, wind, and hydrology. The goal is to establish a connection between natural landforms and artificial modifications introduced by human activity. This component covers:

- Topography
- Geomorphological interpretation
- Techniques of spatial analysis and representation
- Toponymic interpretation

Students should be able to correctly read and interpret visual data on cartographic backgrounds, thereby understanding the relationship between natural sites and built environments. The course also emphasizes the need for students to recognize physical constraints of a site and establish clear connections between natural data and artificial components (such as housing, infrastructure, and utility networks).

### 2. Human Characteristics

- Demographic data sources in Algeria
- Population distribution in Algeria
- Population density and calculation tools for urban planning indicators (TOP, TOL, FAR, BCR, etc.)

**Semester 3**
**Teaching Unit**: ERF3
**Subject**: Sociology and Anthropology of Space
**Coefficient**: 1
**Eliminatory Grade**: Any score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

The primary objectives of this course are to:

- Identify the main concepts, areas of study, and key authors in the sociology of space.
- Analyze the relationships and interactions between humans and space, particularly the connection between the social and the spatial.
- Explore the meaning of space within contexts marked by social and historical diversity, and by varied representations, productions, and social uses of space by humans.
- Examine how individuals, groups, and societies engage with and invest in space, based on the rules of social dynamics.

The specific objective of the course is to enable students to (re)recognize the significance of human space, reflecting its spatial, social, and cultural dimensions (material forms used to explain practices).

## COURSE CONTENT

- Introduction to sociology: definition and scope of the discipline
- Key thinkers and theoretical frameworks (Auguste Comte, Émile Durkheim, Karl Marx, Max Weber, etc.)
- The emergence of urban sociology: The Chicago School
- The question of space in sociology
- Logics and structures of space
- Forms of spatial appropriation: perceived space, built space, lived space
- Uses and meaningful practices of space; the inhabitant as an active agent
- Space, time, and socio-cultural diversity:
    - Cultural models, social organization, and spatial forms
- Space and spatial actors (with a focus on the informal and vernacular context in Algeria: key actors, know-how, challenges, and consequences)

**Semester 3**
**Teaching Unit**: SP3 – Introductory Internship 3
**Subject**: Visits and Explorations of Organizations Involved in the Production, Management, Supervision, and Realization of Architecture and the City
**Coefficient**: 1
**Eliminatory Grade**: Any score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

- To explore the processes of planning, design, execution, management, and supervision of architecture and the urban environment.

## SPECIFIC OBJECTIVES OF THE COURSE

- To identify and understand the mechanisms and various stakeholders involved in the creation of architectural and urban projects.
- To gain insight into the modes of management and supervision governing architecture and the city.

## COURSE CONTENT

- **Visits to architecture and urban planning offices (both public and private)**: guided field visits.
  Initially, students will be introduced to the host institution (organizational structure, legal status, etc.).
  They will then gather data related to project creation using appropriate tools (interviews, questionnaires, document analysis, etc.).

  Students will also explore increasingly technical topics such as drawing, 3D models, and modeling effects.
  Additionally, they will engage with various professionals involved in different stages and responsibilities related to the design, supervision, and realization of architectural and urban projects.

- **Deliverable**:
  A detailed report for each visit, compiled in a well-structured written document (10 to 15 pages), including photographs.
  The report must be submitted in printed A4 format as well as a digital copy to the instructor responsible for the course.

# SECOND YEAR PROGRAM: SEMESTER 4

## Semester 4

**Teaching Unit**: EF4
**Subject**: Project Workshop 4
**Coefficient**: 4
**Eliminatory Grade**: Any score below 10/20

### GENERAL OBJECTIVES OF THE COURSE

In continuity with the previous semester, this workshop addresses sociocultural determinants in the architectural design process. Housing, in its various morphologies and through its domestic, residential, and urban dimensions, constitutes the thematic framework in which this objective is implemented.

### COURSE CONTENT

Design of residential complexes according to various typologies (collective, individual, semi-collective, and/or intermediate) and in diverse locations (central, peri-urban, purely residential, etc.).

## Semester 4

**Teaching Unit**: EF4
**Subject**: History of Architecture 4
**Coefficient**: 2
**Eliminatory Grade**: Any score below 07/20

### GENERAL OBJECTIVES OF THE COURSE

The development of architecture experienced an unprecedented acceleration. The rise of functionalism and modern architecture gradually shifted architectural thought away from academicism toward a redefinition of the values associated with "beauty." The main objectives of this course include:

- Understanding and analyzing the major shift that occurred during this period, transitioning from aesthetic values, ornamentation, style, and decoration toward an architectural approach that prioritizes functionality and rationality, as captured in Sullivan's maxim "Form Follows Function."
- Acquiring the vocabulary and conceptual framework of the modern movement and 20th-century architectural production (free plan, free façade, prefabrication, dissolution of the box, etc.). Students should recognize that architectural concepts are the result of historical development and must grasp the chronological context and interrelations between these concepts.
- Developing a critical appreciation of functionalist, modern, and postmodern architecture as social, cultural, and political phenomena. Students should be able to identify the strengths and negative impacts of such architectural approaches on societal and cultural dimensions.
- Becoming familiar with critiques of modern architecture and understanding the responses proposed by postmodern architects, who sought to integrate the formal innovations of modernism with a renewed sensitivity to historical and cultural contexts. This will enable students to appreciate that architecture is a constantly evolving discipline, responsive to changing social, cultural, and aesthetic challenges.
- Raising awareness among students of current issues and technological developments in architecture, particularly the role of digital technologies in design and production (CAD, CAO, BIM, parametric design, artificial intelligence). Environmental awareness, energy management, HQE (High Environmental Quality), and sustainability will also be addressed. Students will be encouraged to reflect on how to integrate these concerns into their future architectural practice.

### COURSE CONTENT

- The Modern Movement in Architecture:
    - Italian Futurism
    - The Bauhaus School
    - Cubism
    - Russian Constructivism
    - De Stijl Movement (Netherlands)
- Le Corbusier:
    - The Five Points of Modern Architecture
    - Urban Vision (Radiant City)

    - Brutalism
- CIAM and the International Style:
    - The Athens Charter
    - The International Style (Works of Mies van der Rohe, Niemeyer, Neutra)
    - Modern Architecture Worldwide (Japan, Algeria, USA)
- Postmodernism:
    - The Work of Robert Venturi
    - Deconstructivism
    - High-Tech Architecture and Structuralism
- Contemporary Trends and Current Issues

## Semester 4

**Teaching Unit:** EF4
**Course:** Project Theory 4

**Coefficient:** 2
**Eliminatory Grade:** Any grade below 07/20

## GENERAL OBJECTIVES OF THE COURSE

- Introduce students to the concepts of dwelling and habitability by exploring the fundamental ideas behind the formation and development of living environments, particularly traditional (vernacular) settlements—their production modes, organization, typologies, etc. The study of such habitats worldwide and in Algeria serves as a tangible contextual reference.
- Integrate sociocultural factors into housing design, emphasizing that housing must be conceived as an integral part of the urban fabric.
- Investigate the principles and concepts of "inhabiting" that reflect the reality of Algerian society, thereby enabling the design of housing suited to the lifestyle and cultural model of the Algerian family.

## COURSE CONTENT

**Focus:** Emphasis is placed on national and local architectural production in the field of housing.

### Housing: Concepts and Foundations

- Definitions of key concepts (housing, habitation, inhabiting, inhabited, etc.)
- Accessibility of the site
- Population concentration: grouping and delimitation
- Functional diversity or polyvalent zoning
- Typological variety of buildings
- Non-built public spaces
- The identity character of a place

### Modern Housing: Forms and Types

- Characteristics of housing forms
- Housing typologies based on location
- Housing typologies based on density/compactness
- Housing typologies based on grouping patterns

### Housing Policy in Algeria

- Housing issues in Algeria

- Colonial housing: rental apartment buildings
- Policies related to Muslim neighborhoods
- Large-scale housing developments and the Constantine Plan
- Socialist villages post-1962
- New Urban Housing Zones (Z.H.U.N)
- New towns
- Key strategies for addressing housing and habitation challenges in Algeria

**Housing Production Methods: Planned and Administered**

- Planned housing
- Administered housing
- Spontaneous housing

## Semester 4

**Teaching Unit:** EA4
**Course:** Construction 2

**Coefficient:** 2
**Eliminatory Grade:** Any grade below 05/20

## GENERAL OBJECTIVES OF THE COURSE

This course aims to explain the impact of secondary building works on controlling interior comfort and safety, and to assess the complexity involved in managing indoor environments within buildings.

## COURSE CONTENT

- Masonry: bedding and bonding techniques (cut stone, bricks, concrete blocks, rubble stone, shuttered, traditional, mixed or composite)
- External and internal walls: components (foundation base, wall body, bands, tie beams, crowning), types (fence walls, basement walls, facade and partition walls, partitions)
- Roof structures and types, building waterproofing, thermal and hygrometric behavior
- Plasters, façades, and leveling coatings (layers: bonding coat or roughcast, base coat, finish coat) (roughcast/smooth)
- Floor coverings (slabs, tiling, paving, various surface coverings for platforms, courtyards, and roadways)
- Screeds, under-screeds, and floating slabs
- Construction of openings (jambs, straight and arched lintels, mullions, sills, shapes and profiles of sills)
- Joints and cover joints
- Smoke ducts (Shunt systems, VH/VB, types of chimney caps and crowns, inclinations)
- Scaffolding (horizontal, vertical, metallic, cantilevered, mobile)
- Prefabrication and modular elements (aerated concrete, interlocking pavers, cladding panels)

**Supervised Work and Practical Applications in Semester 4**
a. Research work related to the various courses
b. Construction site simulation (carrying out a construction project from site organization to finishing works)
c. Development of construction details
d. Preparation of a specifications document for the model-based construction project

## Semester 4

**Teaching Unit:** EA4
**Course:** Strength of Materials 2 (RDM 2)

**Coefficient:** 2
**Eliminatory Grade:** Any grade below 05/20

## GENERAL OBJECTIVES OF THE COURSE

The objective of this course is to enable students to acquire fundamental concepts in the strength of materials in order to:

- Design and verify simple structural components.
- Communicate effectively with specialists regarding the sizing of structural elements.
- Design architectural projects that integrate both artistic and technical aspects, reflecting the unique role of the architect.

This module introduces students to the mechanical behavior of materials under various types of loads (Tension, Compression, Shear, Torsion, and Bending), as well as the design of components and assemblies subjected to simple and combined forces within structural systems.

## COURSE CONTENT

### Tension and Compression

- Members subjected to tensile forces
- Members subjected to compressive forces

### Shear

- Definition
- Shear testing
- Shear stress

### Torsion

- Definition
- Deformations – Angle of twist
- Torsion testing
- Shear stress and angle of twist
- Torsional moment and angle of twist

**Simple Bending**

- Members subjected to simple bending (slabs and beams)
- Concept of bending moment; calculations and diagrams

**Complex Bending (Deviated, Combined)**

- Deviated bending
- Combined bending

**Hyperstatic Systems**

- Degree of hyperstaticity
- Hyperstatic planar structures
- Hyperstatic beams

**Frames and Portals – Truss Systems – Buckling**

- Elastic equilibrium (stable and unstable)
- Critical force
- Stability analysis

## Semester 4

**Teaching Unit:** EA4
**Course:** Computer-Aided Design (CAD)

**Coefficient:** 1
**Eliminatory Grade:** Any grade below 05/20

## GENERAL OBJECTIVES OF THE COURSE

- Provide students with practical tools to produce graphic project documents more efficiently and with high precision.
- Introduce an interactive tool offering architects diverse manipulation capabilities in both 2D and 3D, enabling rapid verification of conceptual choices.
- Understand the methodological differences between prototyping tools and production tools as aids in the design process.

## COURSE CONTENT

### Part 1: 2D CAD Learning using AutoCAD

- Understanding the operating system
- Introduction to CAD software (general concepts, command syntax, entity properties)
- Drawing commands (precision tools, layers, text, dimensioning, graphic elements, etc.)
- Editing commands (selection, selection modes, parameters, etc.)

### Part 2: 3D CAD Learning with Design Software

- Training on a 3D design tool (coordinate systems; wireframe, surface, and solid modeling)
- Axonometric and perspective projections
- Basic principles of surface and solid modeling tools and techniques (Boolean operations, spatial rotation, symmetry, etc.)
- Introduction to camera insertion in a project and how to create a walkthrough animation

## Semester 4

**Teaching Unit:** ER4
**Subject:** Surveying Techniques
**Coefficient:** 1
**Eliminatory Grade:** Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

Introduction to surveying techniques is a crucial component in the training of architects, as it immerses students in the methods of building, ultimately contributing to the design process. The course aims to:

- Develop a *tangible* understanding of built structures, including their spatial and formal composition, structural components, and materials used;
- Acquire historical knowledge of construction methods;
- Develop projection skills and spatial visualization abilities.

## COURSE CONTENT

The semester will be divided into lectures (for theoretical knowledge) and practical sessions (for application trials).

**Theory (8 sessions):**

- Historical overview of surveying techniques;
- Survey methods and the use of instruments;
- Basic knowledge (sketching, preliminary phase, field campaign);
- Application methods (direct survey/trilateration, indirect survey/photogrammetry).

**Practice (6 sessions):**

- Development of restitution skills. The object of application is chosen by the practical course instructor. Collaboration may be established with the History of Architecture module or the Design Studio (application on either a contemporary building or a historical structure).

## Semester 4

**Teaching Unit:** ER4
**Subject:** Anthropology of Habitat
**Coefficient:** 1
**Eliminatory Grade:** Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

The organization of habitat and modes of living offers a more precise analytical framework for understanding housing, social status, and rituals. The material, ritual, and symbolic phases of construction precede the act of producing a dwelling.

## COURSE CONTENT

- Introduction to the anthropology of habitat; theories and evolution of the concept
- Concepts of occupation:
    - Shelter
    - Appropriation
    - Personal space
- The notion of boundary and orientation:
    - Humanized vs. non-humanized space
    - Interior and exterior boundaries
    - The house and its orientations
- The impact of living space on the individual:
    - Perception
    - Psychological development and identity at the individual and group level
- Space and behavior:
    - Control, Power, Interaction
- Influence and projection of lifestyle on the production of habitat
- Dimensions of residential space: Symbol, Culture, and Identity

**Semester 4**
**Teaching Unit:** Discovery Internship 4 (SP4)
**Subject:** Visits and Explorations of Various Organizations Involved in the Production, Management, Supervision, and Realization of Architecture and the City 2
**Coefficient:** 1
**Eliminatory Grade:** Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

- To explore the processes of planning, design, realization, management, and supervision of architecture and the city.

## SPECIFIC OBJECTIVES OF THE COURSE

- To identify and understand the mechanisms and various stakeholders involved in the creation of architectural and urban projects;
- To identify and understand the methods of management and supervision of architecture and the city.

## COURSE CONTENT

- Guided visits to various technical services (urban planning, housing and infrastructure construction, etc.) and to the CTC (Technical Control Body).

In this context, students will also visit technical services related to the fields of architecture, construction, and supervision. This practical training experience aims to expose students to the external professional environment, allowing them to gain insight into the various sectors and services that contribute to the production, management, and supervision of the built environment.
This process will enable students to develop a situational overview describing the various stakeholders involved in fulfilling the technical and legal responsibilities inherent to the act of building.

A detailed report (for each visit), written and illustrated, must be submitted in the form of a document of 10 to 15 pages, including photographs. The report should be presented in printed A4 format along with a digital copy, both of which are to be submitted to the instructor in charge of the course.

## THIRD YEAR PROGRAM: SEMESTER 5

**Semester 5**
**Teaching Unit:** EF5
**Course Title:** Design Studio 5
**Coefficient:** 4
**Eliminatory Grade:** Score below 10/20

## GENERAL OBJECTIVES OF THE COURSE

The third-year curriculum aims to deepen students' mastery of tools and methods in architectural design, with a particular focus on public facilities. The project is approached as an iterative and interactive process, bridging theoretical formulation with spatial representation. Design is treated holistically, considering the triad of form, function, and structure, while integrating the urban scale. The targeted competencies are developed at multiple levels—from urban analysis to architectural design—by building upon prior learning. The objectives include:

- Introduction to the various stages of the architectural and urban design process;
- Understanding the complexity of a project emerging from contextual issues and identifying appropriate design solutions;
- Establishing a necessary relationship between the architectural object and its implantation context;
- Stimulating and developing the ability to synthesize through observation and analysis of the design phenomenon;
- Encouraging visualization of the architectural object in its functional, formal, and structural dimensions.

## COURSE CONTENT

The course includes **short-term design projects** that support **longer, more complex projects**, focusing on specific aspects such as design approaches or particular situations. However, students are required to take into account comfort standards, spatial usage norms, sustainable materials, and...

## Semester 5

**Teaching Unit:** EF5
**Course Title:** History of Architecture 5
**Coefficient:** 2
**Eliminatory Grade:** Score below 07/20

## GENERAL OBJECTIVES OF THE COURSE

The teaching of the history of Algerian architecture and its local context is of vital importance for several reasons. Firstly, it enables students to understand the roots and influences that have shaped Algerian architecture. Furthermore, studying the history of local architecture contributes to the preservation of the country's architectural heritage by raising student awareness of its significance. Finally, it enhances the understanding of Algerian cultural identity and architectural heritage, allowing students to connect more deeply with their cultural legacy, better understand their place in history and contemporary society, and develop the capacity to intervene appropriately in the local context. This course aims to:

- Introduce students to knowledge of architecture in Algeria;
- Provide foundational knowledge of architectural styles in Algeria during the 19th and 20th centuries;
- Equip students with conceptual tools to interpret architectural language and develop critical judgment concerning architectural production in 19th- and 20th-century Algeria;
- Build a cultural foundation (both architectural and historical) rooted in the local context;
- Deliver basic factual knowledge on the development and transformations of cities during the contemporary period (19th and 20th centuries).

## COURSE CONTENT

- **The Libyco-Punic Civilization:**
  - The Berbers: ancient arts (Neolithic) and dwellings;
  - The Phoenicians: trading posts and cities in the Maghreb;
  - Formation and expansion of Punic civilization;
  - Funerary architecture of the Mauretanian and Numidian periods (e.g., *Medracen*, Royal Mausoleum of Mauretania, Royal Mausoleum of Syphax, Tomb of Massinissa, Mausoleum of Sabratha, Mausoleum of Dougga, the *Djeddars* – the pyramids of the Maghreb).
- **Elements of Traditional Algerian Architecture:**
  - Urban (medina), oasis, mountainous, and *ksour* architecture.
- **Urban and Medina Contexts:**
  - Casbah of Algiers, Old City of Constantine, Cities of the M'Zab Valley, etc.
- **Colonial Urban Planning in Algeria:**
  - Interventions in the medinas, demolitions, the role of military engineering, *castrametation*, creation *ex nihilo*, etc.

- **Colonial Transformations:**
  - Adaptive reuse of buildings.
- **Architectural Styles of the Colonial Period in Algeria:**
  - Neoclassical, Neo-Moorish, Art Deco, and Modern Architecture.

## Semester 5

**Teaching Unit:** EF5
**Course:** Project Theory 5
**Coefficient:** 2
**Eliminatory Grade:** Score below 07/20

## GENERAL OBJECTIVES OF THE COURSE

Building upon the knowledge acquired during the first two years, this course aims to equip students with practical understanding, supported by theoretical insights that will aid in the design work conducted in the project studio. The fundamental objective is to provide an education focused on the mastery of spatial design tools and their practical application in architectural projects. This includes principles and elements of architectural composition, types of spatial organization, among others.

## COURSE CONTENT

- Methodology of architectural projection
- Stages of the spatial creation process
- Principles of spatial organization (served/servant space, regulating lines, structuralism/functionalism/formalism, etc.)
- Spatial organization systems: centralized, linear, radial, organic, grid-based, composite
- Spatial approaches (constrained plan/free plan): structural space, free plan, inclined planes
- Qualities of architectural space (hierarchy, articulation, flexibility, acoustic design, etc.)
- Spatial dualities and tensions (public/private, clean/dirty, dry/humid, quiet/noisy, full/empty, static/dynamic, order/disorder)
- Perception and representation in architectural design (mental representation, real space vs. represented space)

## Semester 5

**Teaching Unit:** EF5
**Course:** Structures in Architecture 1
**Coefficient:** 2
**Eliminatory Grade:** Score below 07/20

## GENERAL OBJECTIVES OF THE COURSE

Architecture must fulfill its intended functions while simultaneously serving as an expression of culture. The necessity of structure—to ensure the rigidity and strength of buildings—is self-evident. Structure is inseparable from architecture and constitutes a fundamental component of its expression, even when concealed.

The teaching of this subject to future architects must differ from that given to civil engineering students. The primary aim is to prepare architecture students to understand the diversity of structural systems and their contribution to architectural expression.

The Semester 5 objectives include:

- Raising awareness of the structural necessity in preserving architectural forms
- Understanding the role of structure in architecture
- Identifying the key dimensions of structural mechanics
- Distinguishing between various types of forces and structural functions

## COURSE CONTENT

- Definition of structure
- Necessity of structure
- Structure and geometry
- Structural functions: "Spanning", "Supporting", "Bracing", and "Founding"
- The variety of forms these functions can take

**Spanning Function:**

- Linear spanning
- Surface spanning
- Classification
- Beam
- Truss beam
- Cable
- Arch

**Supporting Function:**

- Two categories of load-bearing elements: point-based and linear

- Different materials used for the supporting function
- Varied expressive potentials of columns and walls

**Bracing Systems:**

- Diverse bracing configurations and associated expressions
- Internal forces
- Overturning
- Buckling (the physical phenomenon of buckling)

**Founding Function:**

- Types of structural failures due to foundation issues
- The five types of foundations based on soil resistance
- Economic justification for micro-piles
- Economic justification for tension cable anchors
- Necessity of geotechnical testing

**Bracing Function:**

- Structural connections: distinction between ground/structure and structure/structure joints
- Definition of a joint
- Support technologies
- Bracing devices
- Structural stability

**Semester 5**
**Teaching Unit**: EA5
**Course**: Equipment 1

**Coefficient**: 2
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

The *Equipment 1* course primarily focuses on thermal comfort within buildings, including heating, air conditioning, ventilation, and air treatment systems. It also addresses other interior installations such as sanitary plumbing (potable water supply and drainage), gas installations, and more.

## COURSE CONTENT

This first semester will cover the following chapters:

1. Indoor comfort
2. Thermal comfort in buildings and heating and air conditioning systems (heat transfer phenomena, climatic and thermal aspects, thermal balance, different types of heating and air conditioning systems)
3. Building ventilation and technical ducts
4. Sanitary plumbing (supply and drainage)
5. Gas installations and technical requirements for architectural design
6. Fire protection in buildings

**Semester 5**
**Teaching Unit**: EA5
**Course**: Modeling and Simulation 1

**Coefficient**: 1
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

This course introduces the BIM (Building Information Modeling) approach by developing mastery of several key concepts essential to its implementation, both theoretically and practically.
It also aims to establish the exchange of information between the different disciplines taught, in order to simulate the studio project using various digital modeling and simulation tools.

## COURSE CONTENT

- Presentation of the history and emergence of digital modeling and simulation tools in Architecture, with a focus on the BIM approach
- Consolidation of knowledge acquired in the Computer-Aided Design (CAD) course from Semester 4
- Presentation of the different types of digital modeling and simulation
- Identification and structuring of the information required for the construction of a digital model, which will be built and simulated during the following semester

**Semester 5**
**Teaching Unit**: ERF 5
**Course**: Urban Design

**Coefficient**: 1
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

Urban forms and their transformations lie at the heart of urban design—an emerging field at the intersection of architecture, urban planning, and landscape architecture. The *Urban Design* option within the master's program in planning provides the knowledge and skills necessary to understand the challenges related to the articulation of multiple scales of intervention. It enables the development of sustainable urban projects that respond to evolving contexts affecting the urban fabric, through the creation of connected, harmonious, inclusive, and sustainable urban environments.
The objective of this course is to develop competencies in the analysis of urban form, urban composition, and the evaluation and management of urban projects.

Upon completion of the program, learners will be able to:

- Analyze sites and territories, including the technical, morphological, and cultural factors governing the development of inhabited urbanized areas
- Intervene in urban areas targeted for requalification or revitalization; design new urban spaces, urban atmospheres, and public places in both central and peripheral areas

## COURSE CONTENT

- The urban fabric
- Urban morphologies and interventions in the city
- Approaches to urban design
- Concepts and practices of urban design
- The notion of landscape
- Landscape aesthetics and site theories
- Physical, architectural, and urban atmospheres

**Semester 5**
**Teaching Unit**: ERF 5
**Course**: Urban and Housing Geography

**Coefficient**: 1
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

This course is structured into two parts, covering both Urban Geography and Housing Geography.

**Urban Geography** aims to introduce students to reading the city, its spatial dimensions, and related challenges.

**Housing Geography** pursues three main objectives:

- Studying the relationships between humans and their modified and developed physical environments
- Analyzing housing according to its unique morphological and socio-demographic characteristics
- Examining the structure of housing at its basic scale: the neighborhood and its facilities

## COURSE CONTENT

### Part 1: Urban Geography

1. Various forms of spatial and functional organization:

- Traditional cities: spatial diversity and historical heritage (European, Anglo-Saxon, Arab cities, Algeria)
- Industrial cities: driving causes of transformation (Europe, the United States, developing countries, Algeria — shared features such as suburbanization)
- Tertiary cities: new specific functions and service sector growth (specialization of centers, industrial restructuring, suburban expansion; developed countries, developing countries, Algeria)
- Urban transformations and their various manifestations: (Globalization, metropolization and their effects on cities; new urban configurations—specialization, sprawl, fragmentation, urban-rural relations; changes in the city's image—issues of identity and reference, urban forms)

### Part 2: Housing Geography
This part is divided into three main themes:

1. **Housing and Geographical Environment**

- Site analysis and its components as constraints or incentives for human settlement and related structures

2. **Housing and Population**

- Mechanisms and processes leading to the formation of the built environment
- Traditional rural and urban housing: environmental adaptation, typology, morphological classification
- Housing and population: demographic and socio-economic characteristics, resident population and density, housing occupation levels (TOL, TOP), activity indicators (employment rates, socio-professional categories), household transformations and mobility
- Urban morphology and social morphology (socio-spatial distribution)

3. **The Neighborhood as a Unit of Urban Life**

- Neighborhood as the basic unit of urban structure
- Neighborhood facilities and infrastructure
- The neighborhood within the city (specialization of neighborhoods, spatial diversity)

**Semester 5**

**Teaching Unit: Practical Training 5 (SP5)**

**Course**: Visit, Discovery, Observation, and Analysis of the Design Process of Contemporary Architectural Works

**Coefficient**: 1

**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

This training module consists of a discovery visit whose main objective is to enable students to grasp and understand the entire design process of an architectural work. It also serves as an introduction to writing a professional internship report.

## SPECIFIC OBJECTIVES OF THE COURSE

The training involves visiting public or private design offices in order to become familiar with:

Project data (program, site selection, site characteristics and environmental context, etc.)

The design process (from concept and sketching to exhibitions, consultations and discussions with the client, development of preliminary and final designs, project approval, etc.), including both drawn and written documentation across various project phases

The roles and responsibilities of the different stakeholders involved in the design process

## COURSE CONTENT

The course consists of visits and discoveries within technical institutions responsible for the design of architectural works. Emphasis is placed on the observation and analysis of the architectural design process.

Several visits will be scheduled and will culminate in a detailed internship report in the form of a written and illustrated document (25–30 pages), including photographs.

The report must be submitted in printed A4 format (other appropriate formats may be accepted), along with a digital copy. The complete work is to be presented and submitted to the instructor in charge of the course.

**Semester 6**
**Teaching Unit**: EF6
**Course**: Project Workshop 6

**Coefficient**: 4
**Eliminatory Grade**: Score below 10/20

## GENERAL OBJECTIVES OF THE COURSE

The course aims to:

- Integrate the architectural project within a current thematic framework addressing urban issues.
- Master the combinatory aspect of architectural design involving relatively complex programs and problems.
- Move beyond the logic of the project as a mere object of representation.

## COURSE CONTENT

As a continuation of Semester 5, the exercises aim to consolidate previously acquired knowledge while emphasizing the personalization of the design approach through a more elaborate and complex issue. This issue should consider the local specificities of the city and the immediate project environment (multi-scalar urban analysis), as well as the teachings of the *Urban Design* course.
Additionally, aesthetic and semiotic dimensions must be addressed to shape the image of the projected architectural object.

**Semester 6**
**Teaching Unit**: EF6
**Course**: History of Architecture 6

**Coefficient**: 2
**Eliminatory Grade**: Score below 07/20

## GENERAL OBJECTIVES OF THE COURSE

The study of Algerian architectural history after independence holds particular significance, as it contributes to the development of a unique architectural identity. Following independence, Algeria underwent a period of rapid modernization marked by the construction of numerous buildings and diverse projects. However, this era of development also led to the loss of much of the country's traditional architectural heritage.

Through the study of Algerian architectural history, students will understand the importance of preserving historical buildings while exploring new architectural ideas and trends. This understanding can help architects develop a renewed Algerian architectural identity that draws inspiration from both local traditions and contemporary movements, while remaining responsive to the needs and constraints of modern society.

Ultimately, the teaching of post-independence Algerian architecture plays a crucial role in building a strong and sustainable national architectural identity. The course aims to:

- Introduce students to knowledge of architecture in Algeria.
- Build knowledge related to architectural production and the profession of architecture in Algeria since 1962.
- Provide a foundational cultural (architectural and historical) understanding derived from the local context.
- Initiate students into contributing toward the development of a national architectural "model."

## COURSE CONTENT

- Major political and economic choices in nation-building and their impact on architecture.
- Foreign architects and their contributions in Algeria: Anatole Kopp, Oscar Niemeyer, Fernand Pouillon, Kenzo Tange, Ricardo Bofill, André Ravereau, Jean Bossu, Luigi Moretti, the Miniawy Brothers, etc.
- Contributions of COMEDOR and early Algerian architects: Abderrahmane Bouchama, Rachid Bourouiba, etc.
- Major urban and architectural interventions (Olympic complex, Emir Abdelkader University, Riadh El Feth, Moufdi Zakaria Cultural Palace, ZHUN experiences, subdivision developments, informal housing eradication projects, etc.)
- Agricultural villages (experiments and assessments)
- New towns (Ali Mendjli, Sidi Abdellah, etc.)
- National Architecture Awards
- Landmark projects: major facilities (Great Mosque of Algiers, Ministry of Finance, Ministry of Foreign Affairs, etc.), major real estate development projects, etc.

## Semester 6

**Teaching Unit: EF6**

**Course**: *Project Theory 6*
**Coefficient**: 2
**Eliminatory Grade**: Score below 07/20

## GENERAL OBJECTIVES OF THE COURSE

As a continuation of the Semester 5 course, the objective is twofold: to further develop the teaching of design tools and to contextualize the architectural object within its environment.

## COURSE CONTENT

- **Spatial delimitation**: space defined by objects, intervals, voids, residual space, ambiguous space, etc.
- **The concept of axis in design**: axis of symmetry, axis of composition, balancing axis, visual axis, etc.
- **Specific aspects of design**:
    - *Volume and site plan* (placement, regulations, solid/void ratio, interior/exterior relationship, etc.).
    - *Façade* (language/style, horizontality/verticality, lightness/heaviness, unity/diversity, abstraction, depth, etc.).
    - *Entrance* (main/service, protruding/recessed, low/monumental, classical/modern).
    - *Staircases* (terminology, straight/curved/quarter-turn/central post, suspended/supported, Blondel's formula).
- **Universal Design**.
- **Creativity channels**: primary generators of design (metaphorical, analogical, stylistic imitation, etc.).
- **The dialectic between the architectural object and its environment**: pragmatic, iconic, rational, functional, landscape-based, etc.
- **Illustrative examples of master architects**: Alvar Aalto, Adolf Loos, Louis Kahn, etc.

**Teaching Unit: UEM6**

**Course**: *Structures in Architecture 2*
**Coefficient**: 2
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

The primary objective of Semester 6 is to address the concept of *load transfer* and introduce the fundamental principles of preliminary structural sizing.
It involves revisiting the various loads that act on a building and contribute to load transfer, and demonstrating how to perform a basic load transfer analysis for a simple structure with straightforward geometry and loading.

## COURSE CONTENT

- **Load transfer**:
  - Principle of load transfer in a simple structure
  - Identification of loads applied to the slab
  - Consideration of the self-weight of structural elements in load calculations
  - Distribution of loads from beams to supporting columns
  - Calculation of loads at the base of columns and their transfer to foundations
  - Hierarchical load transfer through the structural system
  - Structural vocabulary

**Teaching Unit: EA6**

**Course**: *Building Equipment 2*
**Coefficient**: 2
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

- To assimilate the principles of acoustic comfort.
- To acquire general knowledge of building sound insulation.
- To master acoustic treatment of spaces based on their geometry and appropriate material selection.
- To master building insulation against environmental noise using acoustic barriers.
- To master building insulation against airborne and impact noise.

## COURSE CONTENT

**1. Introduction to building acoustics**
1.1. Definition and historical background
1.2. Acoustic comfort
1.3. Basic concepts of sound and noise
1.4. Sound propagation
1.5. Sound characteristics: acoustic intensity, frequency, period, wavelength, speed

**2. Physical and physiological characterization of sounds and noises – Sound propagation in open space**
2.1. Acoustic pressure
2.2. Sound pressure level
2.3. Acoustic intensity level
2.4. Sound power level
2.5. Superposition of multiple sound levels
2.6. Octave, octave band, and third-octave
2.7. Weighted sound levels
2.8. Isophonic curves: Fletcher diagram

**3. Acoustic phenomena in enclosed spaces – Acoustic correction**
3.1. Sound source on a surface: reflection, transmission, and absorption
3.2. Sound propagation in closed spaces
3.3. Sound intensity and levels in a room: direct and reverberated intensity
3.4. Reverberation time – Sabine's formula
3.5. Acoustic treatment of rooms – Use of sound-absorbing materials

**4. Sound insulation in buildings**
4.1. Insulation from environmental noise using acoustic barriers
4.2. Insulation from impact noise
4.3. Insulation from airborne noise:

- 4.3.1. Modes of noise transmission within buildings: direct, lateral, and flanking transmission
- 4.3.2. Sound reduction index of partitions

- 4.3.3. Experimental mass and frequency laws
- 4.3.4. Method of evaluating the sound reduction index of walls

## Semester 6

**Teaching Unit: EA6**

**Course**: *Modeling and Simulation 2*
**Coefficient**: 1
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

The objective is to explore in greater depth, through practical application, the principles and various workflows of BIM (Building Information Modeling) introduced in the first-semester course, in order to develop a structured semantic digital model based on a BIM object catalog.

## COURSE CONTENT

This module focuses primarily on learning intelligent parametric modeling techniques, simulations, understanding BIM dimensions, and generating schedules and data extraction from student-developed projects. The following chapters will be addressed:

- Design tools and plugins
- Importing DWG files
- Libraries, families, and BIM objects
- Annotating and documenting the project
- BIM aspects, project schedules, and information extraction
- Cameras, axonometric views, and perspectives
- Realistic rendering and complementary tools
- Phasing and clash detection
- Simulations

The levels of detail addressed will include:

- **LOD 100**: Conceptual phase with volumetric modeling
- **LOD 200**: Preliminary design phase where elements such as walls, roofs, and floors are identified

**Teaching Unit: ERF6**

**Course**: *Introduction to Urban Planning*
**Coefficient**: 1
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

To equip students with a body of historical and theoretical knowledge that enables them to construct informed references for any discourse or intervention related to urban matters.

## COURSE CONTENT

- **Part I**: Introduction to urban planning concepts and notions from a theoretical perspective.
- **Part II**: Overview of the founding theories and doctrines of urban planning. This includes contextual exposition of the major schools of thought, intellectual movements (from the past two centuries), and the technical foundations that have shaped our current urban territories and fabrics. The aim is to foster analytical and critical capacities in students when evaluating urban interventions and the theories behind them. Ultimately, students will understand that many planning tools and instruments are rooted in theoretical, ideological, and political considerations about territory and urban space.
- **Part III**: Exploration of contemporary urbanism, addressing real-world urban challenges and crises. Students will recognize that urban planning involves more than a mere change of scale from architecture—it engages with highly complex realities involving technical, land tenure, economic, and socio-political dimensions. Environmental concerns further amplify this complexity.
  Topics may include:
  - Post-COVID urbanism
  - Smart cities
  - Resilient cities

**Teaching Unit: ERF6**

**Course**: *Tools and Methods for Urban Analysis*
**Coefficient**: 1
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

To introduce and develop basic knowledge of conceptual, methodological, and logistical tools necessary for analyzing projects within their urban contexts.

## COURSE CONTENT

- **Morphogenesis and historico-interpretative methodology**
    - Reference to the English School of Urban Morphology (Cambridge and Bartlett School), including works by Llewelyn Davies, Lionel March, Philip Steadman, among others
- **Bernard Duprat's morphological approach (LAF)** and the English School approach
- **Typo-morphological and structuralist analyses**
    - Reference to the Italian and French schools of typo-morphology, including works by Caniggia, Muratori, Aldo Rossi, Panerai, etc.
- **Landscape analysis**
- **Perceptual analysis**
- **Lived experience analysis**
- **Space syntax**

**Semester 6**

**Teaching Unit**: Practical Internship 6 (SP2)

**Course:** Visit, Discovery, Observation, and Analysis of the Design Process of Urban Projects

Coefficient: 1

**Eliminatory Grade:** Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

This internship is a discovery-based visit aimed primarily at enabling students to grasp and understand the complete process of designing an architectural or urban project. It also serves as an initiation into the methodology of writing an internship report.

## SPECIFIC OBJECTIVES OF THE COURSE

The internship involves visits to public or private design offices to become acquainted with:

Project data (program, site selection, characteristics of the site and its environment, etc.)

Design process (from initial concept, sketches, presentations, consultations and discussions with the client, development of preliminary and final designs, to project approval), along with the drawn and written documents corresponding to the various project phases

Roles and responsibilities of the various stakeholders involved in the design process

## COURSE CONTENT

The internship consists of visits and discovery activities within technical organizations responsible for designing urban works (urban planning projects, land subdivisions, parks, public gardens, public squares, etc.). Emphasis will be placed on the observation and analysis of the design process.

Several visits will be scheduled and culminate in the submission of an internship report in the form of a written and illustrated document (25 to 30 pages), including photographs. The report must be submitted both as a printed version (in A4 format or other appropriate formats) and a digital copy. The complete work will be presented and submitted to the faculty member responsible for the course.

**FOURTH YEAR PROGRAM: SEMESTER 7**

**Semester 7**
**Teaching Unit**: EF7
**Course**: Project Workshop 7
**Coefficient**: 4
**Eliminatory Grade**: Score below 10/20

## GENERAL OBJECTIVES OF THE COURSE

- Introduction to the practice of urban and architectural programming;
- Acquisition of fundamental tools enabling the transition from the conceptual idea of the project to the formulation of an execution file for an architectural and urban project;
- Development of the student's ability to navigate the dialectical relationship between client requirements and construction feasibility.

## SPECIFIC OBJECTIVES OF THE COURSE

- Immersion and familiarization with the necessary procedures within the programming process of an urban operation and the realization of an architectural project: written documents, graphic materials, various missions, etc.;
- Responding to a project brief that compels the student architect to reconcile the client's demands with technical and environmental constraints in favor of the integrity of the project.

## COURSE CONTENT

To achieve these objectives, the teaching team selects a neighborhood (or part of one) requiring intervention. A shared site allows students to observe that multiple valid solutions can emerge from a single context.
The coursework includes:

- Urban analysis aimed at determining the nature of the intervention,
- Proposal of a program,
- Urban composition scheme (master plan), and
- An architectural project developed to the execution scale.

**Semester 7**
**Teaching Unit**: EF7
**Course**: Urban and Architectural Programming
**Coefficient**: 2
**Eliminatory Grade**: Score below 07/20

## GENERAL OBJECTIVE OF THE COURSE

Mastery of programming as both a design tool and a framework for critical thinking in architectural practice.
Awareness of the programming phase as a foundational domain for both qualitative and quantitative production in architecture.

## SPECIFIC LEARNING OBJECTIVES

- Development of critical thinking concerning the evolving context of programming practices and the diverse methods it entails beyond mere spatial quantification;
- Framing the act of programming across various scales of intervention in architectural projects.

## COURSE CONTENT

The course is divided into two parts:

**Part One** presents a genealogical reflection aimed at identifying, within the origin of ideas and practices in programming, references that help explain the current conditions of its application across its various scales and procedures.

**Part Two** aims to analyze and understand the practical modes of programming, as well as the forms of knowledge and know-how it entails—i.e., clarifying each method based on the nature of the project it addresses.

**Course Outline:**

1. Programming versus Program
2. Genesis of Programming Processes
3. Programming Scales
4. References in Spatial Programming for Architectural Projects
5. Spatial Programming:
    - Basic ergonomic methods
    - Sizing of functional units
    - Determination of livable areas
    - Circulation calculations and service annexes (technical rooms, parking spaces, green areas)
6. References and Methods in Urban Programming:
    - Sizing thresholds for urban entities (neighborhoods, neighborhood units, housing clusters, residential complexes)
    - Common indicators of urban form (Floor Area Ratio (FAR), Site Coverage Ratio (SCR), Density)
    - Urban planning regulations (setbacks and clearance distances)

    - Facility grids
    - Urban programming within planning instruments: GPU, PDAU, POS
7. Mixed-use Programming:
    - Modes of production and government surface-based programs in Algeria
    - Urban and spatial programming methods for housing projects by type (promotional, social, subsidized social): determination of built-up area, roadways, service annexes, number of housing units, building types, and groupings
    - Urban and spatial programming for major facilities:
        - Programming by facility size and area of influence
        - Financing: registration, reassessment, restructuring technical sheets
8. Operational Programming of Architectural Interventions:
    - (Rehabilitation, Requalification, Conversion)
    - Institutional and regulatory framework
    - Action contexts: Technical diagnosis, cost estimation, action protocol definition

**Note:** Coordination with the project workshop is mandatory.

## Semester 7

**Teaching Unit**: EF7
**Course**: Structural Systems in Architecture 3
**Coefficient**: 2
**Eliminatory Grade**: Score below 07/20

## GENERAL OBJECTIVES OF THE COURSE

- Deepen the knowledge acquired in Semesters 5 and 6 by transitioning from classical small-span structures to special structural systems;
- Familiarize students with various structural types, emphasizing the interrelation between structure and architecture;
- Initiate students into the selection of structural systems during architectural design, including the preliminary sizing of special structures.

## COURSE CONTENT

**Large-span structures**:

- Metal structures (steel sections and frames, spatial tubular or truss structures, three-dimensional systems)
- Curved shell structures and prestressed concrete
- Composite structures (Steel/Concrete)
- Glued laminated timber and wooden frameworks
- Tensile structures / Suspended roofs
- Inflatable structures / Textile membranes

**High-rise building structures (Tall Buildings)**:

- Characteristics of various structural systems used in tall buildings
- Recommendations according to current building codes and regulations

*Note: Coordination with the architectural design studio is mandatory.*

## Semester 7

**Teaching Unit**: EA7
**Course**: Building Equipment 3
**Coefficient**: 2
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

This semester addresses visual comfort, ambiance, natural lighting, artificial lighting, and renewable energy applications in buildings.

## COURSE CONTENT

**1. Visual Comfort and Standards**
1.1 Visual comfort: Definitions and general principles
1.2 Applicable standards

**2. Natural Lighting**
2.1 Photometric quantities and photometry
2.2 Natural lighting systems
2.3 Sun and architecture – climatic potential and solar gain
2.4 Sun and architecture – sunlight control through architectural form, light, and color

**3. Artificial Lighting**
3.1 Building lighting – Standards, regulations, and best practices
3.2 Basic concepts in electricity and electrical energy
3.3 Different types of electrical wiring setups
3.4 Emergency lighting
3.8 Urban lighting using conventional electrical energy
3.9 Urban lighting using photovoltaic (PV) solar energy

**4. Renewable Energies**
4.1 Categories and types of renewable energy
4.2 Solar thermal energy
4.3 Photovoltaic solar energy (PV panels, PV systems, components of PV systems, etc.)
4.4 PV applications (PV lighting, PV pumping systems, integrated PV, grid-connected PV systems)
4.5 Wind energy

## Semester 7

**Teaching Unit**: EA7
**Course**: Roads and Utility Networks (VRD)
**Coefficient**: 2
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

To deepen knowledge in the field of roadworks and utility networks as they relate to architectural projects.
The learning goal is to acquire fundamental concepts related to roads and utility systems, including: earthworks, potable water supply networks, domestic wastewater networks, stormwater drainage systems, electrical networks, and road infrastructure.

## COURSE CONTENT

This course offers both theoretical knowledge and practical methods for resolving urban engineering problems (VRD), which are essential in training architects responsible for designing projects, drafting technical specifications, and supervising and coordinating construction work.
The following chapters will be covered:

- **General overview**
- **Earthworks**: Phases of excavation work, earthmoving operations, volume calculations
- **Potable water supply networks**: Key components of urban hydraulic systems, network layout, operational requirements, water demand, distribution networks, calculations and sizing
- **Domestic wastewater networks**: Network accessories, types of sanitation systems, flow evaluations, factors influencing design, longitudinal profile layout
- **Stormwater drainage networks**: Rainfall, runoff, flooding, network design (sizing, construction, malfunctions), sustainable urban water management
- **Electrical networks**: Power distribution systems, voltage categories, network components and configurations, transformers, light sources (lamps), radial distribution, outdoor lighting
- **Road infrastructure**: Administrative classification, design and construction of urban roadways (criteria, dimensions, pavement), overview of intersections (types and sizing)

## Semester 7

**Teaching Unit**: ERF7
**Course**: Sustainable Architecture and City
**Coefficient**: 1
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

This course provides a comprehensive technical and critical overview of the concept of sustainability as applied to urbanism and architecture. It explores urban development within the context of rapid population growth, environmental degradation, and climate change. Students will learn the essential principles required to design energy-efficient, high-quality buildings with optimal comfort.

## COURSE CONTENT

### Part 1: Sustainable City

- From the Athens Charter to the Aalborg Charter: a paradigm shift
- Smart cities and resilient cities
- Information and communication technologies as tools for effective decision-making
- Eco-districts
- Principles and methods of sustainable urban planning
- From eco-district to sustainable neighborhood
- Urban heat island phenomenon
- Sustainable mobility
- Sustainable waste management
- Sustainable water management
- Major environmental risks
- Urban greening and the integration of agricultural practices in urban settings

### Part 2: Sustainable Architecture

### Introduction

- Principles of sustainable architecture
- Various certifications and eco-construction labels

### Bioclimatic Design

- Fundamentals of bioclimatic design
- Types of bioclimatic buildings
- Key criteria for successful bioclimatic design

### Ecological Materials
### Water and Energy Management

- Techniques for conserving water and energy in construction
- Various renewable energy systems for buildings

- Ecological lifestyles and shared spaces

**Case Studies and Practical Projects**

- Case studies of sustainable cities (e.g., Barcelona, Amsterdam) and successful green buildings

## Semester 7

**Teaching Unit**: ERF7
**Course**: Architectural and Urban Heritage
**Coefficient**: 1
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

- Raise awareness of heritage values
- Acquire knowledge about heritage and various types of interventions on heritage sites
- Develop skills in diagnosing the condition of old (heritage or other) buildings

## COURSE CONTENT

### Chapter I:

- Overview of the theoretical foundations of the heritage concept (general principles, historical background, schools of restoration, typologies)
- The concept of value in heritage
- Content and limitations of various heritage charters
- The process of heritagization: definitions, principles, and methodologies
- The issue of urban heritage (various approaches and intervention operations: revitalization of historic cities, conversion of brownfield sites for heritage purposes, etc.)
- Heritage protection and enhancement measures: inventory, classification, preservation instruments, enhancement, and management tools

### Chapter II:

- Introduction to conducting diagnostics on the conservation status of buildings
    - Techniques for identifying and inspecting materials, structures, and frameworks
    - Analysis of pathologies affecting materials, structures, and frameworks (including structural disorders and ground-related issues)
    - Risk assessment related to natural phenomena
- Introduction to architectural, constructive, and structural intervention methods
    - Monumental interventions: temporary or permanent consolidation, emergency measures, repair or replacement of structures or materials, anastylosis, cleaning and façade treatment, protection against moisture and aggressive or polluting agents, adaptation to modern technical standards

## Semester 7

**Teaching Unit**: Practical Internships
**Course**: SP7
**Coefficient**: 2
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

This internship is an exploratory visit aimed at enabling the student to grasp and understand the entire process of executing an architectural or urban project. It also includes training in writing an internship report. The experience provides insight into the complexity of the socio-professional environment and helps the student understand the different roles and responsibilities of the stakeholders involved in the realization of an architectural project.

## SPECIFIC OBJECTIVES OF THE COURSE

The aim is to focus on an architectural or urban project in progress to gain understanding of:

- Company selection
- Organizational charts
- Execution plans and technical details
- Site layout plans
- Various project phases and stakeholders involved
- Monitoring of construction phases
- Site reports
- Work progress reports
- Provisional acceptance, remarks, and final acceptance
- Others...

## COURSE CONTENT

Site visits and discovery within active construction sites. The focus will be on observing and analyzing the execution process. Multiple visits will be scheduled and will culminate in a written and illustrated internship report (25 to 30 pages), including photographs. The report must be submitted in printed A4 format (other appropriate formats may be accepted), along with a digital copy. The final submission is to be presented and handed over to the instructor in charge of the course.

# FOURTH YEAR PROGRAM: SEMESTER 8

## Semester 8

**Teaching Unit**: EF8
**Course**: Project Workshop 8
**Coefficient**: 4
**Eliminatory Grade**: Score below 10/20

## GENERAL OBJECTIVES OF THE COURSE

- Consolidation of the knowledge acquired in Semester 7, particularly in managing an architectural project dossier.
- Mastery of written and graphic expression tools related to the execution of an architectural project: adherence to specifications, execution plans, and regulatory written documentation.
- Enabling students to independently manage the entire "project" process.
- Introduction to the complex dimension of architectural project management through the integration of various construction technologies.
- Mastery of technical and architectural detailing.
- Mastery of the integration of secondary trades and building systems.

## COURSE CONTENT

In continuity with Project Workshop 7, and following the development of a preliminary design, work proceeds on the same project (or a portion of it) with the preparation of a detailed execution file (DEX), including both graphic and written documents.
The objective of Project Workshop 8 is to design a fully feasible architectural project, incorporating all relevant parameters involved in the act of building.

### Phase 1 – Execution File (Architecture, Scale 1:50)

- Site plan (Scales: 1/500, 1/200)
- Layout plan (Scales: 1/100, 1/200)
- Earthworks plan (Scales: 1/100, 1/200)
- Floor plans for all levels (Scale: 1/50)
- All facades (Scale: 1/50)
- Minimum of two cross-sections, including one through a staircase (Scale: 1/50)
- Foundation plan (Scale: 1/50)
- Roof plan (Scale: 1/50)
- Joinery schedule (Scale: 1/20)
- Technical construction details and architectural details (Scales: 1/20, 1/10, 1/5, 1/2)

### Phase 2 – Execution File (Technical Systems, Site Infrastructure, and Written Documents)

- **Building Technical Systems (CES)**:
  - Indoor sanitation, potable water supply, gas, heating, air conditioning, electricity, fire protection, low-voltage systems
- **Site Infrastructure (VRD)**:
  - Outdoor sanitation, potable water supply, gas, electricity, telecommunications
- **Project Specifications Document**, including:
  - Specification books
  - Descriptive bill of quantities
  - Unit price schedule
  - Quantitative and cost estimate

## Semester 8

**Teaching Unit**: EF8
**Course**: Project Management and Contracting Authority
**Coefficient**: 2
**Eliminatory Grade**: Score below 07/20

## GENERAL OBJECTIVES OF THE COURSE

- Acquire knowledge about the roles and responsibilities of the project manager (Maître d'œuvre) in the realization of projects related to facilities, infrastructure, and superstructures.
  Upon completion of the course, the student should be able to:
- Understand the missions of the project manager;
- Master the Algerian regulatory framework governing project management;
- Prepare a quantitative and cost estimate and a construction progress schedule.

## COURSE CONTENT

### Chapter I: Project Management (Maîtrise d'œuvre – MOE)

- Definitions and functions of the project manager
- Regulatory framework for project management: Study of key legal texts in Algerian regulations (see references below), and the scope of the project manager's missions
- Practice of project management: Design and supervision roles, use of digital tools, preparation of project specifications
- Architectural tasks: Sketch design, Preliminary Design (APS), Detailed Preliminary Design (APD), Execution Drawings (DEX), applications for building permits and other administrative authorizations (CTC, CTH, Civil Protection, etc.)

### Chapter II: Building Economics

- Quantity surveying and construction economics: Introduction to quantity surveying, basic quantity calculation concepts (with examples and exercises)
- Price analysis and price variation: Calculating unit prices for various work items, including:
  - Estimating quantities of components
  - Calculating hourly labor costs
  - Calculating untaxed material costs delivered to site
  - Estimating costs for using production equipment assigned to individual work units
  - Detailed unit price breakdown (dry costs)
  - Determining the markup coefficient (P.V.H.T / D.S) and calculating total unit prices
  - Preparing the Quantitative and Cost Estimate (D.Q.E.)

- Price variation: Aligning the project with financing capacity and adjusting for price changes

**Chapter III: Site Organization and Construction Phases**

- Timeframes, project scheduling, and planning: Understanding construction deadlines, especially in the context of Algerian public procurement laws, and the economic implications of failing to meet contractual deadlines

## Semester 8

**Teaching Unit**: EF8
**Course**: Structural Systems in Architecture 4
**Coefficient**: 2
**Eliminatory Grade**: Score below 07/20

## GENERAL OBJECTIVES OF THE COURSE

- Introduction to structural choices in architectural design
- Familiarization with different types of structures while reinforcing the relationship between structure and architecture

## COURSE CONTENT

### Structural Stability in Relation to Seismic Forces

- Seismic design: General principles, design approaches, risks, and proposed solutions
- Regulatory framework: Algerian RPA code and Eurocode – Evolution of building codes in Algeria
- Horizontal and vertical bracing systems: Applications in reinforced concrete, steel, or composite structures and their architectural expression
- Seismic joint layouts and structural regularity

### Structure and Architecture

- Fundamental criteria for structural design; development of the structural framework
- The concept of form in structures and the relationship between architecture and structural form
- Interdependence of materials and structural systems (shapes, dimensions, site-specific considerations)
- Case studies of special structures

## Semester 8

**Teaching Unit**: EA8
**Course**: Secondary Building Works (CES)
**Coefficient**: 2
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

Understanding the relationship between construction, materials, and equipment in alignment with architectural design. Acquiring knowledge of various construction materials (both traditional and contemporary) that contribute to enhancing the quality of an architectural project. The choice of materials bridges the transition from design to reality and influences the perception of both observers and users.

## COURSE CONTENT

- Definitional elements: Architectural detail, technical detail
- Transition from design to detailing
- Material selection
- Detailing and scale of representation
- Learning to draw architectural details
- Details in structural works (shell)
- Details in finishing works (secondary works)
- Details in technical equipment systems

## Semester 8

**Teaching Unit**: EA8
**Course**: Introduction to Research Methodology
**Coefficient**: 1
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

- Introduction to scientific research; acquisition of basic concepts and tools for research
- Constructing research objects, formulating the research problem, and building coherent arguments
- Defining objectives and methodological approaches

## COURSE CONTENT

General characteristics of scientific thinking: Characteristics of science / Scientific research / Methodological approaches / Formulation of the research problem / Operationalizing the research issue

## Semester 8

**Teaching Unit**: EA8
**Course**: Decision Support Tools
**Coefficient**: 1
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

This course addresses the growing need for competence in Geographic Information Systems (GIS) and decision support tools in the professional domain. The focus is increasingly on training students to use software for the manipulation and analysis of spatial data, rather than merely producing static map representations.

## COURSE CONTENT

### Introduction to GIS

- Definition of GIS
- Importance of GIS in decision-making processes
- Advantages of GIS in project management
- GIS applications: Spatial planning and urbanism, infrastructure planning and management (transportation, energy), public health (disease mapping), crisis management (natural disasters, epidemics, etc.)

### GIS Components

- Data collection for GIS
- Types of geographical data to collect (tabular data, scanned maps, vector and raster formats)
- Sources of geographical data
- Data storage in GIS
- Types of geographic databases (vector databases, raster databases)
- GIS data formats:
    - Vector formats: SHP (ArcGIS, QGIS), TAB (MapInfo)
    - Raster formats: GeoTIFF and others

### Introduction to GIS Tools (ArcGIS / QGIS / MapInfo)

- User interface overview
- Handling geographic information
- Visualizing vector data
- Loading vector data from shapefiles
- Measuring lengths, areas, and angles
- Vector layer properties (changing visual representation, locating layers, filtering data)

**Coordinate Reference Systems (CRS)**

- Adding raster layers and modifying their properties

**Geodesy**

- Adding point data from a text file
- Georeferencing
- Digitization (digital mapping)

**Queries**

- SQL queries
- Creating, deleting, renaming, and calculating fields
- Joins (linking data from two different sources)

## Semester 8

**Teaching Unit**: ERF8
**Course**: Construction and Urban Planning Law
**Coefficient**: 1
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

The aim of this course is to introduce architecture students to the essential elements of practical legal knowledge. It focuses primarily on legislation related to construction law and urban planning law (including regulations in architecture and urbanism).
This course is designed to familiarize students with the Urban Planning Code and the Construction Code.

**Specific objectives include:**

- Acquiring fundamental legal knowledge on the general principles of law and the legal foundations of laws specific to the discipline;
- Exploring laws specific to construction and urban planning (regulations in architecture and urban planning).

## COURSE CONTENT

**Urban Planning Regulations (Urban Planning Code):**

- History of urban planning law (urban planning regulations) in Algeria and other countries;
- Contemporary urban planning law: constitutional law of urbanism and planning law based on forecasting;
- Main urban planning documents:
    - For strategic and prospective planning;
    - For regulatory urban planning;
- Operational urban planning law: authorization laws, urban planning-related taxation, preemption rights, abandonment rights, expropriation for public utility purposes;
- Urban planning penal law (disputes over documents and authorizations);
- Urban planning instruments in Algeria (PDAU, POS, etc.) and urban regulations (COS, CES, etc.);
- Urban planning acts (building permits, subdivision permits, demolition permits, lot division certificates, compliance certificates, urban planning certificates).

**Architectural Regulations (Construction Code):**

- Construction and habitability standards;
- Property boundary rights and easements;
- Ten-year warranty and completion guarantee;

- Contracts for individual house construction and their execution;
- Contracts for real estate development and sale before completion;
- Contracts and agreements with construction companies;
- Professional standards and technical norms in construction;
- Construction defects and judicial expert assessments;
- Building permits and construction regulations (public health, monument and site protection, etc.);
- Standards and benchmarks for equipment and sizing.

## Semester 8

**Teaching Unit**: ERF8
**Course**: Ethics and Professional Conduct
**Coefficient**: 1
**Eliminatory Grade**: Score below 05/20

## COURSE CONTENT

### Part 1: Research – Tensions Between Conceptual Intelligence and Practical Intelligence

- Chapter 1: Scientific research and academic disciplines
- Chapter 2: Educational research – challenges and approaches
- Chapter 3: Exploring practices in reflective professions aiding human development

### Part 2: Applied Research Methodologies

- Chapter 4: Evaluative research
- Chapter 5: Action research strategies
- Chapter 6: Developmental research
- Chapter 7: Ontogenetic research

### Part 3: Applied Research Techniques

- Chapter 8: Contextualized information retrieval
- Chapter 9: Analysis and synthesis of information
- Chapter 10: Discourse analysis
- Chapter 11: Modeling and simulation

### Part 4: Ethics, Teaching, and Pedagogical Research

- Chapter 12: Ethics and professional conduct in teaching and research

## Semester 8

**Teaching Unit**: Practical Internship
**Course**: SP8
**Coefficient**: 2
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

This internship serves as an introductory field experience, aiming to help the student grasp and understand the complete process of urban project realization. It also introduces the student to writing a professional internship report. The goal is to appreciate the complexity of the socioprofessional environment and to identify the various missions and stakeholders involved in the realization of urban projects.

## SPECIFIC OBJECTIVES OF THE COURSE

The internship focuses on observing an architectural or urban project under construction to learn about:

- Selection of the construction company;
- Organizational charts;
- Execution plans and details;
- Site layout plans;
- Project execution tasks and involved stakeholders;
- Monitoring of construction phases;
- Site reports;
- Work progress status;
- Provisional handovers, reservations, and final acceptance;
- Other relevant aspects.

## COURSE CONTENT

The internship includes site visits and on-site observation and analysis of the construction process. Several field visits will be scheduled and will culminate in a comprehensive internship report. This report must be both written and illustrated (25–30 pages), including photographs. The final submission must be presented in printed A4 format (other formats as appropriate) with a digital copy. The report is to be presented and submitted to the course instructor.

# FIFTH YEAR PROGRAM: SEMESTER 9

## Semester 9

**Teaching Unit**: EF9
**Course**: Project Workshop 9
**Coefficient**: 8
**Eliminatory Grade**: Score below 10/20

## GENERAL OBJECTIVES OF THE COURSE

The pedagogical objectives of the first semester aim at the learning and application of methodologies primarily focused on the formulation of a design problem related to the area of intervention. To this end, students are required to collect relevant documents and information in order to conduct analyses and diagnostics at various scales, and to develop a program and conceptual diagrams enabling them to define their intervention project.

## COURSE CONTENT

Students will be required to maintain a **project logbook**, which will include their ideas, concepts, collected or produced documents, and information supporting their approach and design choices throughout the project development process.

Overall, the course is intended to train students to:

- Observe a real situation that calls for a design approach;
- Question the observed reality using an architect's perspective;
- Adopt an architectural methodology, with exploratory, analytical, and diagnostic approaches, to enrich a particular field or thematic, based on real-life contexts.

The course is structured into **phases**, each marked by **intermediate evaluations** allowing the instructor to monitor and guide the student's progress. These phases include:

1. **Statement of personal motivations**, observation, questioning, and the identification of methods and approaches.
2. **Analysis of similar contexts** through comparative study (introduction to project selection, comparison criteria, deconstruction of project complexity, identification of constants and variables, synthesis through the recomposition of a new complexity specific to the intended project by transposing constants and constructing specific variables).
3. **Development of a preliminary program**, stating and justifying operational choices (in terms of actions and design strategies), and defining architectural/urban/spatial design orientations and stylistic tendencies.

4. **Site and terrain selection and analysis** (selection criteria, comparative analysis of potential sites, detailed analysis of the selected site and terrain).
5. **Expression of design responses** through sketches of alternatives or scenarios, presented as conceptual diagrams. These will be evaluated to determine the selection of a final project solution.

## Semester 9

**Teaching Unit**: EF9
**Course**: Building Energy Performance
**Coefficient**: 2
**Eliminatory Grade**: Score below 07/20

## GENERAL OBJECTIVES OF THE COURSE

- Establish diagnoses related to energy demand and thermal comfort.
- Evaluate the impact of each construction parameter on the building's energy performance level.
- Complementing thermal assessments, students will become familiar with scientific and technical tools (software) used in the field.

## COURSE CONTENT

The course consists of three main parts:

**1. Construction parameters affecting energy performance:**

- Building envelope (insulation, joinery, treatment of thermal bridges)
- Heating, Ventilation, and Air Conditioning (HVAC)
- Lighting (contribution of natural lighting, measuring illuminance)

**2. Technical solutions for optimal energy performance in buildings:**

- Preserving thermal mass (building inertia)
- Minimizing thermal losses
- Reducing energy consumption
- Integration of renewable energy sources

**3. Energy diagnosis (principles and methods):**

- Levers for energy control
- Methods for conducting energy diagnostics
- Integration of passive design strategies in architectural design

**Tutorial Content (TD):**
Tutorials will support theoretical knowledge through the application of various strategies aimed at improving comfort and the thermal performance of the studied building.

## Semester 9

**Teaching Unit**: EA9
**Course**: Entrepreneurship and Project Management
**Coefficient**: 1
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

- Develop entrepreneurial skills necessary to effectively manage an architectural practice, lead project teams, and handle organizational and financial aspects of the profession.
- Acquire management skills: “planning, budgeting, and controlling.”
- Master the process of architectural and urban project development and implementation.
- Understand the role of the project manager.

## COURSE CONTENT

**Project management:** Project lifecycle, knowledge domains, and process groups

1. **Introduction to management**: General introduction to the concept and importance of management in architecture. Principles of management, knowledge domains, process groups, different approaches, and required competencies.
2. **Project management**: Fundamentals including planning, organization, coordination, monitoring, and control of architectural projects. Architectural project lifecycle (design phases, regulations, technical constraints, deadlines, etc.).
3. **Integration management**
4. **Scope management**
5. **Cost management**: Basic concepts of financial management applied to architecture. Project budgeting, cost estimation, expense monitoring, profit margin management, service pricing, and financial analysis.
6. **Time management**
7. **Quality management**
8. **Risk management**
9. **Human resources and stakeholder management**: Skills required for managing human resources in an architectural firm: recruitment, team management.
10. **Marketing and communication**: Fundamental principles of marketing and communication in architecture. Defining a marketing strategy, promoting architectural services, managing client relations, building a project portfolio, using social media, and effective communication with stakeholders.

## Semester 9

**Teaching Unit**: EA9
**Course**: Introduction to Architectural Thesis Writing
**Coefficient**: 2
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

- Master methodological tools for preparing and writing a thesis.
- Develop skills in conceptualization, argumentation, debate, synthesis, and academic writing (problem formulation, contextualization, etc.).
- Develop the conceptual and theoretical framework of a project.

## COURSE CONTENT

- What is a thesis
- General structure of the thesis
- Topic and title selection
- Literature review and bibliography
- Problem statement and hypotheses
- Research methods
- Thesis outline (table of contents)
- Results, analysis, interpretation, and discussion
- Conclusion, introduction, and abstract
- Overall organization, formatting, illustrations and graphics, bibliography, table of contents, appendices, cover page.

## Semester 9

**Teaching Unit**: ERF9
**Course**: Seminar on Contemporary Architectural Issues
**Coefficient**: 1
**Eliminatory Grade**: Score below 05/20

## GENERAL OBJECTIVES OF THE COURSE

This course aims to inform students about the multiple, yet often relative, forms of innovation in architecture. It may involve new approaches to working with existing structures, evolving methods and processes, and the dynamics between different project stakeholders.
A particular emphasis is placed on current architectural developments in Algeria.

**Specific objectives include:**

- Acquiring architectural culture
- Initiation into debate and oral communication
- Raising awareness of challenges related to architecture and the profession
- Updating and renewing knowledge related to architectural practice, with special focus on the Algerian context.

## COURSE CONTENT

This seminar will feature contributions from various stakeholders, including faculty members, researchers, practicing professionals, and developers. These contributions aim to go beyond the dissemination of information and foster dialogue and debate among students.

Students (as future professionals or researchers) will be encouraged to develop engagement with contemporary issues in architecture, urbanism, design, and art, as well as an awareness of major challenges facing cities and architecture both globally and in Algeria.

Thematic content will include:

- New technical processes and contemporary discourses in architecture
- Innovative approaches to working with existing structures
- Emerging professional practices and systems of project stakeholders

## Semester 9

**Teaching Unit:** Professional Internship
**Course Code:** SP9
**Coefficient:** 2
**Eliminatory Grade:** Below 05/20

### GENERAL OBJECTIVES OF THE COURSE

- Adaptation of theoretical and practical knowledge to the professional setting.
- Immersion in a real professional environment.

### SPECIFIC OBJECTIVES OF THE COURSE

- Execution of design, implementation, and supervision tasks within:
  Public or private design offices, construction companies, and other relevant organizations.
- Simulation of the professional practice of architecture.
- Foster an entrepreneurial mindset among students.

### COURSE CONTENT

This internship is carried out individually by each student, based on agreements and internship conventions established and signed by the faculty with the relevant host organizations and institutions such as: design offices, the National Order of Architects, construction sites, contracting companies, the building industry, local authorities, ministries, urban planning agencies, etc.

At the end of the internship, the student must submit an internship report which will be assessed through a defense before a jury composed of:

- A representative from the host organization (mentor/supervisor),
- The course instructor responsible for supervising internships,
- An external jury member,
- Other internal members.

The internship report must be a written, illustrated, and referenced document (20 to 30 pages), including photographs. It should be submitted in printed A4 format, along with a digital copy.

# Fifth Year Program: Semester 10

## Semester 10

**Teaching Unit:** EF10
**Course Title:** Final Year Project (PFE)
**Coefficient:** 10
**Eliminatory Grade:** Below 10/20

### GENERAL OBJECTIVES OF THE COURSE

The objective of the second semester is primarily architectural design, building upon the first semester's foundations in contextual analysis, diagnostics, and theoretical exploration. The goals include:

- Development and mastery of *personal* and methodological principles for formulating and developing an architectural *idea* or concept into a project.
- Mastery of communication skills and representation tools for the project (written, oral, drawings, simulations, models, etc.).
- Acquisition and development of the ability to mobilize both practical and theoretical knowledge acquired during the training to respond to complex project situations (approach, reflect, design, represent/communicate).
- Acquisition of basic autonomy in professional development.
- Enabling each student, based on the work completed in Semester 9, to affirm their chosen topic and position through a critical examination of the relationship between the proposed project and the questions raised in the thesis, establishing a dialogue between design and the theoretical framework developed in Semester 9.

### COURSE CONTENT

Project instruction is viewed as a tool for research and experimentation, placing the student in an exploratory stance both methodologically and creatively. Through the analysis of real issues, uses, and tools, students are invited to develop their own architectural thinking and design autonomously within the constraints and opportunities of the local context and actual stakeholder dynamics.

Instruction is focused on a disciplinary support approach. Students are mentored and guided to construct their own knowledge and skills, ultimately leading to autonomous learning that will extend into their professional careers.

The final year project addresses design issues that may involve working on existing structures or creating new ones, depending on the theme. The chosen topic serves to frame the architectural and urban design practices in coherence with local contexts, users' expectations and lifestyles, and contemporary requirements (environment, sustainability, etc.).

The project is explored across multiple scales simultaneously, from the urban to the detail scale, and from programmatic to formal levels, with a continuous back-and-forth, ensuring

mastery of the relationships between design tools and the regulatory/normative framework for built environments in Algeria.

Students are supported in building a methodological approach based on the analysis of urban, social, cultural, and economic data, and on a design process combining rigor, creativity, and innovation. The project also serves as a basis for technical and/or regulatory development, framing the project proposal in a perspective of operational realization.

**The Final Year Project is individual.** To ensure quality supervision, and based on staff availability, each instructor may supervise a maximum of three PFE projects simultaneously.

## Semester 10

**Teaching Unit:** EF10
**Course Title:** Final Year Thesis
**Coefficient:** 6
**Eliminatory Grade:** Below 07/20

### GENERAL OBJECTIVES OF THE COURSE

- Support students in writing their thesis based on the defined research question.
- Emphasize the student's rigor through structured argumentation, coherent development of ideas, and well-organized document formatting and presentation.
- Finalize the thesis writing: synthesize the work carried out during the previous three semesters in alignment with the design project and incorporate it as part of the theoretical foundation of the thesis.
- Leverage students' acquired critical thinking and synthesis skills in writing the thesis.

### COURSE CONTENT

The thesis writing workshop is structured around the following components:

- Defining the research question and justifying the topic.
- Establishing the methodological framework and developing the thesis outline.
- Preparing the theoretical framework and literature review.
- Conducting the empirical part of the research.
- Writing the thesis conclusion.
- Compiling the bibliography.
- Drafting the thesis abstract in three languages.

To facilitate this, a common thesis template is to be provided to all students at the beginning of the academic year, including writing guidelines (citation formats in-text and in the bibliography, illustrations, tables, etc.). The structure should include:

- An introductory chapter,
- Chapters addressing the theoretical framework,
- An analytical (diagnostic) section,
- The architectural response,
- A general conclusion,
- And a bibliography.

**The thesis must not exceed 60 pages excluding appendices.**