

Private University of Tacna (UPT)
Faculty of Architecture and Urban Planning
School of Architecture



Book of Syllabi

– 2026-II –

Lima: October 18, 2026

Equipo de Trabajo

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1. COURSE

AR1D1. Design Studio I (Mandatory)

2. GENERAL INFORMATION

2.1 Course	: AR1D1. Design Studio I
2.2 Semester	: 1 st Semester.
2.3 Credits	: 4
2.4 Hours	: 4 HT; 4 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Mandatory
2.7 Learning modality	: Face to face
2.8 Prerequisites	: None

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

Design Studio I: Foundations is the student's first encounter with the studio culture that defines architectural education: short, intensive design exercises, physical model-making, pin-up and desk-crit critique, and iterative revision. Starting from purely abstract explorations of space, form, and light, the course progressively scales up these operations into the student's first habitable proposal – a minimal pavilion or similar small object-to-space exercise – while introducing the orthographic and three-dimensional drawing conventions needed to communicate spatial ideas. This course has no prerequisite within the Design Studio sequence and is the foundation for Design Studio II (AR1D2).

5. GOALS

- Identify and apply the fundamental spatial, formal, and compositional concepts – space, form, light, program, and precedent – that underpin architectural design.
- Practice the iterative design process (brief analysis, ideation, model-making, critique, and revision) through short design exercises developed under a studio pin-up/desk-crit culture.
- Produce orthographic drawings (plans, sections, elevations) that correctly apply line-weight and drawing-set conventions.
- Build and present physical study and presentation models of a design proposal, from massing studies to a finished model.

6. COMPETENCES

AG-A04) Communicates effectively and inclusively with the architecture community and society through reports, design documentation, and presentations tailored to different audiences. (Usage)

AG-A09) Creates architectural designs that satisfy aesthetic and technical requirements. (Usage)

7. TOPICS

Unit 1: Foundations of Architectural Design (10 hours)	
Competences Expected: AG-A09	
Topics	Learning Outcomes
• Space, form, and order: positive and negative space, enclosure, threshold, spatial sequence, hierarchy, scale, and proportion as fundamental architectural design concepts • Architectural elements and their spatial roles: wall, floor, ceiling, and roof as enclosure; column, beam, and slab as structure • Composition and formal operations: symmetry, asymmetry, balance, rhythm, repetition, modulation, contrast, and tension as tools of architectural formal organization • Light and shadow as design media: natural light quality by orientation and time, shadow and material surface perception, light as spatial modifier - compression, expansion, focus • Embodied perception of space: scale as bodily experienced rather than drawn, movement and kinesthetic sequence through space, and the visual, acoustic, and tactile engagement that shapes how a space is actually inhabited and felt • Materiality as an experiential design medium: texture, weight, surface finish, and color, and the atmosphere and character that material choice and craft give to a space, as distinct from a material's structural or technical properties • Program and spatial organization: functional zoning and bubble diagrams, circulation systems (horizontal, vertical, service), spatial hierarchy, and programmatic sequence • Precedent study methods: formal analysis frameworks for canonical architectural works; reading plans, sections, and photographs as design intelligence	• Identify and describe the key spatial, perceptual, material, and compositional concepts that constitute the foundations of architectural design [Familiarity] • Apply foundational design principles - space, perception, materiality, light, program, and composition - in the development of a spatial architectural proposal [Usage] • Evaluate a design or building project for the quality of its spatial organization, formal coherence, perceptual experience, material expression, and use of light and program, identifying strengths and areas for improvement [Assessment]
Readings : [Ching2015], [Unwin2014]	

Unit 2: Design Process and Creative Methods (16 hours)	
Competences Expected: AG-A09	
Topics	Learning Outcomes
• Brief analysis and problem framing: decomposing a design brief into spatial, functional, contextual, and performative requirements; identifying constraints and opportunities • Architectural site analysis: solar orientation and sun path, prevailing wind and microclimate, topography and drainage, views and visual axes, vehicular and pedestrian access, surrounding urban fabric and context, and existing site constraints (easements, setbacks, utilities) as inputs to a design concept • Design-criteria formulation: translating client and user requirements, site-analysis findings, and regulatory constraints into a prioritized, measurable set of functional, spatial, environmental, and budgetary criteria used to generate and evaluate design alternatives • Ideation and concept development: sketching, diagramming, and collage as tools to explore spatial ideas; arriving at the parti (partido arquitectónico) – the single organizing idea that drives a design – and translating it into spatial and formal proposals • Physical model-making as a design tool: study models for spatial exploration, massing studies, sectional models, and the role of making in discovering design solutions • Iterative design and critique: pin-up and desk critique culture, receiving and integrating feedback, revision cycles, and developing design judgment through reflection • Design narrative and argumentation: articulating design intent verbally and graphically, building a coherent design argument, and presenting spatial proposals persuasively • Collaborative and interdisciplinary design processes: co-design with engineers, landscape architects, and community stakeholders	• Describe the stages of an iterative architectural design process, from brief and site analysis through design-criteria formulation, concept development (parti), revision, and final proposal [Familiarity] • Apply site analysis, design-criteria formulation, and systematic ideation and iterative critique methods to develop and refine a spatial architectural proposal in response to a design brief [Usage] • Evaluate the coherence and effectiveness of a design process, including the quality of concept articulation, iteration, and responsiveness to critique [Assessment]
Readings : [Lawson2005], [Unwin2014]	

Unit 3: Orthographic Drawing and Conventions (14 hours)	
Competences Expected: AG-A04	
Topics	Learning Outcomes
• Orthographic projections: plan (cut plane at typical eye level or 1.5 m), section (cut through building, showing structure and spatial relationship), elevation (external) • Paraline drawings: isometric (equal angles, true scale), axonometric (plan oblique, elevation oblique), and their use in showing spatial depth without perspective distortion • Perspective (conic projection) drawing: one-, two-, and three-point perspective construction, vanishing points, horizon line, and station point – the convergent-projection family used for experiential and presentation views, as distinct from the parallel-projection conventions of orthographic and paraline drawing • Freehand architectural sketching and schematic diagrams: quick observational sketches and on-site architectural studies ("apuntes") to record buildings and spaces, line quality and proportion by eye, light tonal shading, and parti, bubble, and concept diagrams as a loose, interpretive mode of representation distinct from measured hard-line drawing • Line weight conventions: hierarchy of outline, section cut, foreground, middle ground, background, and hidden lines • Drawing set organization: title block, sheet numbering, drawing index; relationship between plans (architectural, structural, MEP, reflected ceiling), elevations, sections, • Dimensioning and annotation: string dimensions, overall dimensions, grid lines, spot elevations, section marks, finish labels, door and window tags • Normalization of plan representation: ISO 128 (general principles) and ISO 5455 (scales) as international references; national drawing-set and plan-presentation requirements for permit submission (e.g. Peru's Reglamento Nacional de Edificaciones under Ley 29090)	• Identify the standard orthographic, paraline, and perspective drawing types - plan, section, elevation, axonometric, isometric, one/two/three-point perspective - as well as freehand architectural sketching and diagrammatic schemas, and describe their respective uses [Familiarity] • Produce a set of orthographic drawings (plan, section, elevation) for a small building that consistently applies line weight conventions, dimensioning, [Usage] • Evaluate a set of architectural drawings for clarity, completeness, and adherence to graphic standards, identifying missing dimensions, inconsistent line weights, [Assessment]
Readings : [ChingGraphics2014]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

MA100. Basic Mathematics (Mandatory)

2. GENERAL INFORMATION

2.1 Course	: MA100. Basic Mathematics
2.2 Semester	: 1 st Semester.
2.3 Credits	: 5
2.4 Hours	: 3 HT; 4 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Mandatory
2.7 Learning modality	: Face to face
2.8 Prerequisites	: None

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

The Basic Mathematics course is mandatory and provides the conceptual tools necessary for logical reasoning and problem solving. The course ranges from propositional logic and set theory to the study of real numbers, complex numbers, polynomials, and matrices. These concepts are fundamental for developing the abstraction and mathematical formalization skills required in the later stages of the Computer Science program.

5. GOALS

- Develop logical reasoning and critical thinking skills through the use of formal languages.
- Understand and apply the properties of number systems (real and complex) in problem solving.
- Manipulate polynomial and matrix structures to solve systems of equations and interpret results.
- Introduce basic concepts of statistics and probability for data analysis.

6. COMPETENCES

No items for this table

7. TOPICS

Unit 1: Logic and Sets (16 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Propositional logic: Connectives, truth tables, and validity. • Logical-mathematical quantifiers. • Set theory: Operations, relations, and functions. • Families of sets and Cartesian product.	• Formalize natural language statements into propositional language [Familiarizarse]. • Operate with sets using algebraic laws and Venn diagrams [Usar]. • Prove basic properties of sets and logical relations [Evaluar].
Readings : [Lipschutz1991], [Rojo1995]	

Unit 2: Number Systems (16 hours)	
Competences Expected:	
Topics	Learning Outcomes
• The real number system: Field and order axioms. • Mathematical induction and Newton's binomial theorem. • Complex numbers: Binomial, polar, and exponential forms. • Roots of complex numbers and De Moivre's theorem.	• Identify the algebraic structure of real and complex numbers [Familiarizarse]. • Apply the principle of mathematical induction in proofs of summations [Usar]. • Solve equations in the complex number field using various representations [Evaluar].
Readings : [Gentile1985], [Pinzon1973]	

Unit 3: Polynomials and Matrices (16 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Polynomials: Division algorithm and roots of polynomials. • Matrices: Types, operations, and determinants. • Inverse matrix and rank of a matrix. • Systems of linear equations: Gauss-Jordan method.	• Recognize the structure of polynomial rings and matrix algebra [Familiarizarse]. • Use elementary row operations to calculate the inverse of a matrix [Usar]. • Model and solve systems of linear equations applied to contextual problems [Evaluar].
Readings : [Gentile1984], [Rojo1995]	

Unit 4: Statistics and Probability (16 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Descriptive statistics: Measures of central tendency. • Dispersion measures and graphical representation. • Probability concepts: Sample space and events. • Conditional probability and independence.	• Describe data sets using basic statistical indicators [Familiarizarse]. • Calculate probabilities of simple and compound events in random experiments [Usar]. • Interpret statistical results for decision making in scientific environments [Evaluar].
Readings : [Peterson2005]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

MA111. Calculus I (Mandatory)

2. GENERAL INFORMATION

2.1 Course	: MA111. Calculus I
2.2 Semester	: 1 st Semester.
2.3 Credits	: 5
2.4 Hours	: 3 HT; 4 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Mandatory
2.7 Learning modality	: Face to face
2.8 Prerequisites	: None

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

This course introduces the fundamental concepts of differential calculus of single-variable real functions. It provides the mathematical foundations necessary for analyzing change and motion in science and engineering, developing logical reasoning through the study of limits, continuity, and derivatives.

5. GOALS

- Understand the fundamental concepts of limits and continuity.
- Master differentiation techniques for algebraic and transcendental functions.
- Apply derivatives to solve optimization problems and analyze rates of change.
- Develop a rigorous approach to the formal definition of a derivative.

6. COMPETENCES

No items for this table

7. TOPICS

Unit 1: Limits and Continuity (20 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Limits and continuity of single-variable functions	• Interpret the concept of limit and continuity of a function and its relevance to modeling the behavior of architectural systems near a point [Familiarity]
Readings : [Stewart2016], [Larson2018], [Thomas2014]	

Unit 2: Differential Calculus (20 hours)	
Competences Expected:	
Topics	Learning Outcomes
Derivatives and rules of differentiation	- Apply differentiation rules to find rates of change and optimize architectural design parameters [Usage] - Formulate and solve optimization problems for architectural systems using differential calculus [Assessment]
Readings : [Stewart2016], [Larson2018], [Thomas2014]	

Unit 3: Integral Calculus (10 hours)	
Competences Expected:	
Topics	Learning Outcomes
- The Fundamental Theorem of Calculus - Integration techniques including substitution and parts - Architectural applications of integration: areas, volumes, centroids, and moments of inertia	- State and explain the Fundamental Theorem of Calculus [Familiarity] - Calculate definite integrals arising from architectural problems such as work, fluid pressure, and heat transfer [Usage]
Readings : [Stewart2016], [Larson2018], [Thomas2014]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

AR1D2. Design Studio II (Mandatory)

2. GENERAL INFORMATION

2.1 Course	: AR1D2. Design Studio II
2.2 Semester	: 2 nd Semester.
2.3 Credits	: 4
2.4 Hours	: 4 HT; 4 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Mandatory
2.7 Learning modality	: Face to face
2.8 Prerequisites	: AR1D1. Design Studio I. (1 st Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

Design Studio II: Single-Family Housing is the student's first complete, habitable design project, building on the spatial, formal, and representational foundations developed in Design Studio I (AR1D1, prerequisite). Students design a single-family house on a real lot, resolving a full domestic program – living, sleeping, service, and outdoor spaces – while responding to accessibility requirements, daylight and thermal comfort, and the specific conditions of the site. The studio introduces the residential structural systems – confined masonry, timber framing, and reinforced adobe – most commonly used to build a single-family house in Peru. It continues the pin-up/desk-crit critique culture and introduces the communication skills (design boards, physical models, verbal presentation) needed to defend a complete design proposal. This course is the foundation for Design Studio III (AR1D3).

5. GOALS

- Apply human-centered and universal design principles – including accessibility standards – to the design of a complete domestic program on a real lot.
- Resolve the functional, spatial, and site-responsive requirements of single-family housing, from zoning diagrams to a developed floor plan.
- Design building apertures and envelope strategies that provide adequate daylight and passive thermal comfort for the dwelling.
- Select and detail an appropriate residential structural system – confined masonry, timber framing, or reinforced adobe – for the house, considering material availability, cost, and seismic performance.
- Iterate the design proposal through a full studio critique cycle and communicate the final design through boards, models, and verbal presentation.

6. COMPETENCES

AG-A04) Communicates effectively and inclusively with the architecture community and society through reports, design documentation, and presentations tailored to different audiences. (Usage)

AG-A08) Understands the structural and environmental design problems associated with construction and the engineering of building design. (Usage)

AG-A11) Demonstrates knowledge of the physical problems and technologies that allow buildings to provide internal comfort and protection within environmental parameters. (Usage)

AG-A15) Understands the relationship between people, buildings, and their environment, and the need to relate buildings and spaces to human scale and needs. (Usage)

7. TOPICS

Unit 1: Human-Centered and Inclusive Design (8 hours)	
Competences Expected: AG-A15	
Topics	Learning Outcomes
• Universal design principles: equitable use, flexibility in use, simple and intuitive operation, perceptible information, tolerance for error, low physical effort, and size • Accessibility standards and codes: ADA, ISO 21542, and regional building codes for accessible routes, ramps, elevators, restrooms, signage, and emergency egress • Spatial user experience: wayfinding, legibility, sensory richness, acoustic comfort, and the design of spaces that support diverse activities, ages, and abilities • Participatory design processes: engaging future users and communities in defining spatial needs; co-design workshops, interviews, and community mapping as design tools	• Describe the principles of universal design and inclusive architecture and explain how they translate into spatial and technical design decisions [Familiarity] • Apply universal design principles and accessibility standards to develop an architectural design that accommodates the full spectrum of human ability, age, and cultural background [Usage] • Evaluate a building or public space design for inclusivity and accessibility, identifying barriers and proposing design modifications to improve equity and user experience [Assessment]
Readings : [Neufert2012]	

Unit 2: Residential and Vernacular Structural Systems (8 hours)	
Competences Expected: AG-A08	
Topics	Learning Outcomes
• Confined masonry (albañilería confinada): masonry walls confined by cast-in-place reinforced-concrete tie-columns and tie-beams, its seismic behavior and failure modes, and its role as Peru's dominant residential construction system under RNE Norma E.070 • Timber structural systems: heavy-timber post-and-beam framing, light wood framing (platform framing), mass timber (CLT, glulam), and the connections that distinguish each system's load path and seismic behavior • Reinforced and improved adobe (adobe mejorado): seismic retrofitting of earthen walls with geogrid/geomesh, cane (caña), or wire mesh reinforcement to mitigate the brittle failure of plain adobe, per Peru's RNE Norma E.080	• Identify confined masonry, timber, and reinforced earthen construction as structural systems, and describe their seismic behavior, failure modes, and appropriate use contexts [Familiarity] • Select and detail an appropriate residential structural system - confined masonry, timber framing, or reinforced adobe - for a single-family house, considering material availability, cost, and seismic performance [Usage] • Evaluate a single-family house's structural system for seismic adequacy and constructability, identifying code-compliance gaps under RNE Norma E.070 or E.080 as applicable [Assessment]
Readings : [FriedmanHousing2013]	

Unit 3: Housing and Residential Environments (12 hours)	
Competences Expected: AG-A15	
Topics	Learning Outcomes
- Housing typologies: single-family detached, row house, courtyard building, walk-up apartment, point tower, slab block, double-loaded corridor, - Affordable housing strategies: inclusionary zoning, density bonuses, cross-subsidization, public-private partnerships, community land trusts (CLTs), and the financial - Housing quality and dweller control: orientation for sunlight and ventilation, unit depth to window ratio, privacy thresholds (distance to opposite windows), acoustic separation - Mixed-income and social mix housing: fostering social interaction, avoiding stigma of large public housing projects (Pruitt-Igoe lessons), - Housing policy frameworks: Vienna's social housing model, Singapore's public housing, Chilean housing subsidies,	- Identify the principal housing typologies and their urban density contributions, and describe the design qualities that distinguish high-quality residential environments from poorly designed ones [Familiarity] - Design a housing block at the neighborhood scale, specifying building typology mix, dwelling unit orientation and ventilation strategy, [Usage] - Evaluate a housing project for quality of life, affordability, and urban integration, using indicators such as floor-to-ceiling height, access to light [Assessment]
Readings : [Neufert2012], [FriedmanHousing2013]	

Unit 4: Daylighting and Visual Comfort (8 hours)	
Competences Expected: AG-A11	
Topics	Learning Outcomes
- Daylight performance metrics: daylight factor (DF), spatial daylight autonomy (sDA), annual sunlight exposure (ASE), useful daylight illuminance (UDI), and glare indices (DGP, DGI) - Aperture design for daylight: window-to-wall ratio (WWR), head height, sill height, clerestories, saw-tooth roofs, light shelves, - Shading integration for glare and cooling: fixed (overhangs, fins, louvers), operable (roller shades, venetian blinds, screens), - Daylight simulation tools: climate-based modeling (Radiance, DIVA, ClimateStudio, Ladybug Tools); annual simulation for LEED and other certification credits - Electric lighting integration: daylight harvesting controls (dimming, stepped switching), task-ambient lighting strategies,	- Describe the principal daylight performance metrics (sDA, ASE, UDI) and explain how they inform aperture and shading design decisions [Familiarity] - Design and simulate a daylighting strategy for a building facade or roof aperture, iterating on WWR, orientation, and shading to meet defined sDA and ASE targets [Usage] - Evaluate a building's daylighting design from simulation outputs, identifying areas of glare or insufficient illuminance [Assessment]
Readings : [BrownDeKay2001]	

Unit 5: Thermal Comfort and Passive Systems (8 hours)	
Competences Expected: AG-A11	
Topics	Learning Outcomes
• Heat transfer mechanisms in buildings: conduction through assemblies (U-value), convection at surfaces and within cavities, and long-wave • Thermal comfort indices: PMV (predicted mean vote), PPD (predicted percentage dissatisfied), operative temperature, • Passive solar heating: direct gain (south-facing glazing + thermal mass), indirect gain (Trombe wall, water wall), isolated gain (sunspace) • Passive cooling strategies: night-flush ventilation, radiative cooling to the night sky, earth coupling (earth tubes, berming), evaporative cooling (roof ponds, fountains), • Thermal mass strategies: phase change materials (PCMs), exposed concrete or masonry for diurnal heat storage, and the placement of mass relative to insulation and solar gains	• Describe the heat transfer mechanisms that affect building thermal performance and explain the difference between predicted mean vote (PMV) and adaptive thermal comfort models [Familiarity] • Select and apply appropriate passive heating and cooling strategies for a building in a given climate, sizing apertures and mass to reduce predicted heating and cooling loads [Usage] • Evaluate a building's thermal design using simulation or hand calculation, identifying strategies that are underperforming [Assessment]
Readings : [BrownDeKay2001]	

Unit 6: Design Process and Creative Methods (10 hours)	
Competences Expected: AG-A04	
Topics	Learning Outcomes
• Brief analysis and problem framing: decomposing a design brief into spatial, functional, contextual, and performative requirements; identifying constraints and opportunities • Architectural site analysis: solar orientation and sun path, prevailing wind and microclimate, topography and drainage, views and visual axes, vehicular and pedestrian access, surrounding urban fabric and context, and existing site constraints (easements, setbacks, utilities) as inputs to a design concept • Design-criteria formulation: translating client and user requirements, site-analysis findings, and regulatory constraints into a prioritized, measurable set of functional, spatial, environmental, and budgetary criteria used to generate and evaluate design alternatives • Ideation and concept development: sketching, diagramming, and collage as tools to explore spatial ideas; arriving at the parti (partido arquitectónico) – the single organizing idea that drives a design – and translating it into spatial and formal proposals • Physical model-making as a design tool: study models for spatial exploration, massing studies, sectional models, and the role of making in discovering design solutions • Iterative design and critique: pin-up and desk critique culture, receiving and integrating feedback, revision cycles, and developing design judgment through reflection • Design narrative and argumentation: articulating design intent verbally and graphically, building a coherent design argument, and presenting spatial proposals persuasively • Collaborative and interdisciplinary design processes: co-design with engineers, landscape architects, and community stakeholders	• Describe the stages of an iterative architectural design process, from brief and site analysis through design-criteria formulation, concept development (parti), revision, and final proposal [Familiarity] • Apply site analysis, design-criteria formulation, and systematic ideation and iterative critique methods to develop and refine a spatial architectural proposal in response to a design brief [Usage] • Evaluate the coherence and effectiveness of a design process, including the quality of concept articulation, iteration, and responsiveness to critique [Assessment]
Readings : [Lawson2005]	

Unit 7: Architectural Communication and Presentation (8 hours)	
Competences Expected: AG-A04	
Topics	Learning Outcomes
• Design boards and panels: composition principles (grid, hierarchy, contrast, white space), integrating drawings (plan, section, elevation, axonometric, perspective), renderings • Architectural portfolio design: project selection (range of scales, stages, typologies), portfolio structure, narrative, captioning, • Physical model presentation: material choices (cardboard, foam, acrylic, 3D-printed, laser-cut), scale selection, level of detail, lighting • Verbal presentation of design: structuring a 5-10 minute design pitch (problem, concept, proposal, testing, conclusion), visual aids, responding to critique, • Architectural diagramming: circulation, program, structure, environmental performance, form generation, process	• Describe the key elements of effective architectural communication: narrative structure, visual hierarchy, appropriate level of detail, [Familiarity] • Produce a design presentation board (single panel) for an architectural project that integrates orthographic drawings, rendered views, diagrams, [Usage] • Evaluate a design portfolio or presentation for its communicative effectiveness, identifying strengths in narrative and visual clarity [Assessment]
Readings : [ChingGraphics2014]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

ID101. Technical and professional English I (Mandatory)

2. GENERAL INFORMATION

2.1 Course	: ID101. Technical and professional English I
2.2 Semester	: 2 nd Semester.
2.3 Credits	: 2
2.4 Hours	: 1 HT; 2 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Mandatory
2.7 Learning modality	: Face to face
2.8 Prerequisites	: None

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

English is the primary language of science, engineering, and technology worldwide. For computing and engineering students, mastering English means gaining direct access to technical documentation, research papers, and professional collaboration without translation barriers. This course builds foundational English skills using contexts drawn from computing systems, hardware, and the everyday work of engineers and scientists.

5. GOALS

- Acquire foundational English grammar structures applied to computing and engineering contexts.
- Identify and use technical vocabulary related to hardware, software, and scientific concepts.

6. COMPETENCES

No items for this table

7. TOPICS

Unit 1: Welcome to Computing (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Verb To Be: Affirmative, Negative, and Questions. • Personal Pronouns and Possessive Adjectives. • Number Expressions (1-100): Ports, addresses, and binary basics. • Social Expressions in academic and lab environments.	• By the end of the unit, students use the verb 'to be' to introduce themselves as computing students and describe basic properties of computing systems (e.g., "The processor is fast. It is a 64-bit CPU.").
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 2: Parts and Systems (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Possessive 's and Plural Nouns applied to components (the CPU's speed, the system's memory). • Hardware components and their relationships. • Adjective + Noun structures for technical descriptions. • Lab interactions: Asking about equipment and tools.	• Students describe computer hardware components and their relationships using possessives and noun phrases (e.g., "the motherboard's slots", "the server's processors").
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 3: How It Works (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Present Simple I (Third person: He/She/It) to describe processes. • Vocabulary: How programs, algorithms, and devices operate. • Telling the time and interpreting system clocks and schedules. • Verbs of operation: runs, compiles, executes, stores, transmits.	• Students explain how a program or device works using the present simple in the third person (e.g., "The compiler translates source code. It generates an executable file.").
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 4: What Engineers Do (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Present Simple II (I/You/We/They) for describing professional routines. • Questions and negatives with 'Do/Does' in technical contexts. • Engineering roles: developer, analyst, researcher, systems engineer. • Adverbs of frequency in describing work cycles and testing schedules.	• Students describe the daily tasks and professional roles of computing engineers and scientists using the present simple with accuracy.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 5: Inside a Computer (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
- Existential: There is / There are applied to architecture descriptions. - Prepositions of place: components on a motherboard, files in a directory. - Vocabulary: memory, storage, buses, slots, ports, layers. - Describing network topology and physical infrastructure.	Students describe the spatial organization of hardware components and file systems, enabling them to interpret and produce technical architecture descriptions.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 6: Can Computers Think? (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
- Modal verb Can/Can't to describe computing capabilities and limitations. - Adverbs of manner applied to system performance. - Past of verb 'To Be' (Was/Were): early computing systems and pioneers. - Basic expressions for technical support and troubleshooting.	Students describe what computing systems can and cannot do, and identify basic facts about the early history of computing using simple past structures.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 7: Computing History (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
- Past Simple: Regular and Irregular verbs to narrate tech history. - Time expressions for the past: invented, developed, published, launched. - Key figures: Turing, Babbage, Lovelace, von Neumann. - Vocabulary: Generations of computers, milestones, inventions.	Students narrate key events in the history of computing and science using the simple past correctly, identifying the contributions of foundational figures.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 8: My Professional Goals in Computing (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Introduction to Technical English for Computing and Engineering. • Reading and understanding simple technical specifications. • Working in multicultural engineering teams: communication norms. • Oral presentation: "My role in the computing field".	• Students present their professional goals in computing using basic technical vocabulary and connect them to the roles and responsibilities of software and hardware engineers.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

AR1D3. Design Studio III (Mandatory)

2. GENERAL INFORMATION

2.1 Course	: AR1D3. Design Studio III
2.2 Semester	: 3 rd Semester.
2.3 Credits	: 4
2.4 Hours	: 4 HT; 4 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Mandatory
2.7 Learning modality	: Face to face
2.8 Prerequisites	: AR1D2. Design Studio II. (2 nd Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

Design Studio III: Collective Housing moves the student from the single dwelling designed in Design Studio II (AR1D2, prerequisite) to medium-density collective housing. Students explore housing typologies – blocks, duplexes, row houses – and the relationship between the individual unit, the building, and shared community space. The studio places particular emphasis on the lateral structural systems that medium-density housing requires, and on designing equitably for the social diversity of a collective housing community. This course is the foundation for Design Studio IV (AR2D1), which introduces the program's first public building typology.

5. GOALS

- Design housing units within medium-density typologies (blocks, duplexes, row houses) and organize them into a coherent building and urban fabric.
- Analyze and apply urban morphology concepts – street, block, and plot systems – to the siting of a collective housing project.
- Design the lateral load-resisting system (moment frames, braced frames, shear walls) and coordinate it with the floor diaphragm, appropriate to a medium-density housing building.
- Apply equity, accessibility, and gender-sensitive design principles to the design of shared community space within the housing project.

6. COMPETENCES

AG-A02) Applies ethical principles and the standards of professional architectural practice, respecting the legal framework and human diversity. (Usage)

AG-A08) Understands the structural and environmental design problems associated with construction and the engineering of building design. (Usage)

AG-A15) Understands the relationship between people, buildings, and their environment, and the need to relate buildings and spaces to human scale and needs. (Usage)

7. TOPICS

Unit 1: Housing and Residential Environments (12 hours)	
Competences Expected: AG-A15	
Topics	Learning Outcomes
- Housing typologies: single-family detached, row house, courtyard building, walk-up apartment, point tower, slab block, double-loaded corridor, - Affordable housing strategies: inclusionary zoning, density bonuses, cross-subsidization, public-private partnerships, community land trusts (CLTs), and the financial - Housing quality and dweller control: orientation for sunlight and ventilation, unit depth to window ratio, privacy thresholds (distance to opposite windows), acoustic separation - Mixed-income and social mix housing: fostering social interaction, avoiding stigma of large public housing projects (Pruitt-Igoe lessons), - Housing policy frameworks: Vienna's social housing model, Singapore's public housing, Chilean housing subsidies,	- Identify the principal housing typologies and their urban density contributions, and describe the design qualities that distinguish high-quality residential environments from poorly designed ones [Familiarity] - Design a housing block at the neighborhood scale, specifying building typology mix, dwelling unit orientation and ventilation strategy, [Usage] - Evaluate a housing project for quality of life, affordability, and urban integration, using indicators such as floor-to-ceiling height, access to light [Assessment]
Readings : [Schneider2007]	

Unit 2: Urban Form and Morphology (10 hours)	
Competences Expected: AG-A15	
Topics	Learning Outcomes
- Kevin Lynch's city image elements: paths, edges, districts, nodes, and landmarks; their role in legibility and wayfinding; application to urban design analysis and intervention - Street, block, and plot systems: typologies (grid, radial, organic, cul-de-sac), block dimensions and permeability, plot subdivision, - Urban building typologies: single-family detached, row house (townhouse), courtyard building, slab, point tower, and linear block - Morphological analysis methods: Conzenian (burge cycle, fringe belts), space syntax (integration, connectivity, choice), and figure-ground diagrams for reading urban form - Urban fabric layers: plot subdivision history, street network evolution, land use succession, and the persistence of plot boundaries over centuries as a design constraint	- Identify the key morphological elements of a city - streets, blocks, plots, buildings - and describe the relationships among them that define urban character [Familiarity] - Apply morphological analysis tools (figure-ground, space syntax) to an urban sector, identifying its legibility, connectivity, and typological diversity [Usage] - Evaluate the morphological coherence and permeability of a proposed urban design, comparing block sizes, street connectivity, [Assessment]
Readings : [KropfMorphology2017]	

Unit 3: Human-Centered and Inclusive Design (8 hours)	
Competences Expected: AG-A15	
Topics	Learning Outcomes
• Universal design principles: equitable use, flexibility in use, simple and intuitive operation, perceptible information, tolerance for error, low physical effort, and size • Accessibility standards and codes: ADA, ISO 21542, and regional building codes for accessible routes, ramps, elevators, restrooms, signage, and emergency egress • Spatial user experience: wayfinding, legibility, sensory richness, acoustic comfort, and the design of spaces that support diverse activities, ages, and abilities • Participatory design processes: engaging future users and communities in defining spatial needs; co-design workshops, interviews, and community mapping as design tools	• Describe the principles of universal design and inclusive architecture and explain how they translate into spatial and technical design decisions [Familiarity] • Apply universal design principles and accessibility standards to develop an architectural design that accommodates the full spectrum of human ability, age, and cultural background [Usage] • Evaluate a building or public space design for inclusivity and accessibility, identifying barriers and proposing design modifications to improve equity and user experience [Assessment]
Readings : [Neufert2012]	

Unit 4: Lateral Load-Resisting Systems (10 hours)	
Competences Expected: AG-A08	
Topics	Learning Outcomes
• Horizontal load-resisting systems: moment-resisting frames (rigid connections), braced frames (concentric, eccentric), shear walls (concrete, plywood, CLT), • Floor and roof diaphragms: rigid vs. flexible diaphragm behavior, chord forces, collector elements, and load transfer from diaphragms to vertical lateral-resisting elements	• Identify the primary lateral load-resisting systems - moment frames, braced frames, shear walls - and describe the role of floor and roof diaphragms in transferring lateral loads to them [Familiarity] • Select and configure an appropriate lateral load-resisting system - moment frame, braced frame, or shear wall - for a mid-rise collective-housing building, coordinating it with the floor diaphragm [Usage] • Evaluate a mid-rise building's lateral system for configuration irregularities (soft stories, torsional irregularities) and diaphragm continuity [Assessment]
Readings : [Schierle2012]	

Unit 5: Social Equity and Inclusive Urbanism (8 hours)	
Competences Expected: AG-A02	
Topics	Learning Outcomes
• Spatial justice frameworks: Fainstein's just city (democracy, equity, diversity), Soja's seeking spatial justice, • Gentrification and displacement: stages of gentrification, direct and indirect displacement (exclusionary displacement), anti-displacement strategies (rent control) • Participatory planning and community engagement: Arnstein's ladder of participation (manipulation to citizen control), deliberative methods (planning cell, consensus conference) • Equitable transportation: transit deserts, fare equity, accessibility for persons with disabilities, safe routes for walking and cycling, • Gender-inclusive urbanism: safety audits, lighting and sightlines for perceived safety, access to child-care facilities,	• Identify the main dimensions of spatial justice - distribution, procedure, recognition - and describe how urban planning decisions can produce or mitigate inequitable outcomes [Familiarity] • Apply an equity assessment tool (e.g., equity scorecard, health impact assessment) to an urban development proposal, identifying which populations benefit [Usage] • Evaluate a participatory planning process for authenticity, power-sharing, and representation, recommending changes to increase meaningful participation of marginalized [Assessment]
Readings : [FainsteinJustCity2010]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

ID102. Technical and professional English II (Mandatory)

2. GENERAL INFORMATION

- 2.1 Course : ID102. Technical and professional English II
- 2.2 Semester : 3rd Semester.
- 2.3 Credits : 2
- 2.4 Hours : 1 HT; 2 HP;
- 2.5 Duration of the period : 16 weeks
- 2.6 Type of course : Mandatory
- 2.7 Learning modality : Face to face
- 2.8 Prerequisites : ID101. Technical and professional English I. (2nd Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

Building on foundational English skills, this course develops the student's ability to communicate in technical and scientific contexts with greater fluency. Grammar structures are practiced through reading and producing descriptions of technological systems, scientific phenomena, and engineering processes. Students gain vocabulary relevant to computing, data, and the physical sciences.

5. GOALS

- Develop fluency in English applied to technical and scientific communication.
- Expand vocabulary in computing, data, and engineering domains.

6. COMPETENCES

No items for this table

7. TOPICS

Unit 1: Breakthroughs and Discoveries (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Simple Past Review: Affirmative and Negative in scientific contexts. • Time expressions with 'ago': When technologies were invented or released. • Conjunctions: and, so, but, because — structuring technical explanations. • Vocabulary: Scientific milestones, inventions, and discoveries.	• By the end of the unit, students narrate past technological breakthroughs and connect cause-and-effect relationships using simple past and conjunctions (e.g., "Scientists discovered X, so engineers developed Y").
Readings : [Soars021S], [Cambridge06], [MacGrew99]	

Unit 2: Data and Variables (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
- Countable and Uncountable nouns in computing: files, data, code, memory. - Use of some, any, a lot of in quantifying technical resources. - Expressions of quantity: a little memory, a few errors, too many processes. - Vocabulary: Data types, variables, constants, and storage units.	Students correctly use countable and uncountable noun structures to describe data, resources, and system states in technical contexts.
Readings : [Soars021S], [Cambridge06], [MacGrew99]	

Unit 3: Future of Technology (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
- Future plans: Verb + to + infinitive in project planning. - Use of 'Will' vs 'Going to' for predictions and scheduled releases. - Auxiliary verbs in forecasting: AI trends, cloud computing, quantum computing. - Vocabulary: Emerging technologies and career pathways in computing.	Students express technological intentions and project plans, as well as make evidence-based predictions about computing and engineering trends.
Readings : [Soars021S], [Cambridge06], [MacGrew99]	

Unit 4: Comparing Technologies (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
- Comparative and superlative adjectives applied to hardware and software. - Comparing programming languages, operating systems, and algorithms. - Synonyms and antonyms in technical vocabulary. - Reading: Short technology comparison articles and benchmark reports.	Students make detailed technical comparisons between systems, languages, and tools, using comparative and superlative structures accurately.
Readings : [Soars021S], [Cambridge06], [MacGrew99]	

Unit 5: Running Processes (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Present Continuous to describe active and ongoing technical processes. • Current use: "The server is processing requests." • Future use with Present Continuous: scheduled deployments and experiments. • Writing: Status updates and progress reports in technical projects.	• Students describe active computing processes, ongoing experiments, and scheduled technical activities using the present continuous form.
Readings : [Soars021S], [Cambridge06], [MacGrew99]	

Unit 6: Software Milestones (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Introduction to Present Perfect to describe achievements with current relevance. • Keywords: ever, never, yet, just — applied to software releases and research. • Vocabulary: Version history, patches, upgrades, published papers. • Reading: Technology news and software changelogs.	• Students communicate technical achievements and software milestones with present relevance, without specifying an exact time, using the present perfect.
Readings : [Soars021S], [Cambridge06], [MacGrew99]	

Unit 7: Technical Challenges (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Adjectives ending in -ed and -ing to describe technical experiences and processes. • Modal verbs of obligation: must, have to — applied to engineering requirements. • Vocabulary: Engineering challenges, constraints, trade-offs, and standards. • Writing: Short technical problem statements.	• Students describe the emotional and technical aspects of engineering challenges and express obligations and constraints using specialized vocabulary.
Readings : [Soars021S], [Cambridge06], [MacGrew99]	

Unit 8: English for Technology II (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Technical terminology: Input/output devices, storage, and peripherals. • Reading and following software installation and configuration instructions. • Communication in technical support: Describing symptoms and solutions. • Presentation: Describing a computing system to a non-specialist audience.	• By the end of the course, students interpret technical instructions, describe hardware components, and communicate basic computing concepts to diverse audiences in English.
Readings : [Soars021S], [Cambridge06], [MacGrew99]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

AR2D1. Design Studio IV (Mandatory)

2. GENERAL INFORMATION

2.1 Course	: AR2D1. Design Studio IV
2.2 Semester	: 4 th Semester.
2.3 Credits	: 4
2.4 Hours	: 4 HT; 4 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Mandatory
2.7 Learning modality	: Face to face
2.8 Prerequisites	: AR1D3. Design Studio III. (3 rd Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

Design Studio IV: Neighborhood Facilities is the student's first public-building project, following Design Studio III (AR1D3, prerequisite). Working at the scale of a neighborhood library or a community health post, students design a medium-scale public facility and, for the first time in the sequence, develop its structural system explicitly as part of the architectural proposal – selecting and sizing the vertical and lateral load-resisting elements, and coordinating them with construction assemblies, natural ventilation strategies, and the applicable building codes. This course is the foundation for Design Studio V (AR2D2).

5. GOALS

- Apply the fundamental principles of structural mechanics (loads, equilibrium, internal forces) to the design of a medium-scale public building.
- Select and size the vertical and lateral load-resisting systems (columns, walls, frames, diaphragms) of a neighborhood facility.
- Coordinate structural, envelope, and interior systems into a constructible building assembly.
- Verify a design proposal's compliance with applicable building codes, accessibility standards, and zoning regulations.
- Design naturally ventilated spaces using cross-ventilation and stack-effect strategies appropriate to the building's program and climate.

6. COMPETENCES

AG-A08) Understands the structural and environmental design problems associated with construction and the engineering of building design. (Usage)

AG-A12) Possesses the design skills needed to satisfy building users' requirements within cost constraints and building regulations. (Usage)

AG-A14) Possesses creative capacity in construction techniques, grounded in a comprehensive understanding of the disciplines and construction methods related to architecture. (Usage)

7. TOPICS

Unit 1: Structural Principles and Mechanics (10 hours)	
Competences Expected: AG-A08	
Topics	Learning Outcomes
- Types of loads: dead, live, snow, wind, seismic, and thermal; load combinations per ASCE 7; internal force diagrams (axial, shear, moment) in statically determinate beams - Stress-strain relationships for common structural materials: elastic and plastic behavior, yield strength, ultimate strength, modulus of elasticity, and ductility - Static equilibrium equations ($\sum F_x = 0$, $\sum F_y = 0$, $\sum M = 0$) and calculation of support reactions in beams, trusses, and simple frames - Truss analysis: method of joints, method of sections, zero-force members, and truss configurations (howe, pratt, warren, vierendeel) for different span conditions - Beam deflection: moment-area method, superposition, and the role of deflection limits ($L/360$, $L/240$) in serviceability design	- Describe the primary types of structural loads and internal forces, and explain how they influence the sizing and configuration of structural elements [Familiarity] - Calculate support reactions, shear and moment diagrams, and deflection in simple statically determinate beams and trusses [Usage] - Evaluate the structural adequacy of a simple beam or truss configuration against given load and deflection criteria, proposing cross-section or material changes where needed [Assessment]
Readings : [Schierle2012], [Onouye2017]	

Unit 2: Vertical Load Path and Foundations (10 hours)	
Competences Expected: AG-A08	
Topics	Learning Outcomes
- Vertical load-bearing systems: short vs. slender columns, buckling (Euler), effective length factor; load-bearing walls (masonry, concrete, timber, steel studs) - Foundation systems and load transfer: spread footings, continuous footings, pile caps, grade beams, and the role of connections in ensuring load path continuity - Structural grid design: bay sizes, column spacing implications for floor framing (one-way vs. two-way slabs, beam-and-girder, flat plate, flat slab),	- Identify the primary vertical load-bearing elements and foundation systems in a building, and describe how loads are transferred from the structural grid to the foundation [Familiarity] - Select and configure an appropriate column/wall system, foundation type, and structural grid for a medium-rise building, considering program and material availability [Usage] - Evaluate a building's vertical load path for continuity and foundation adequacy, identifying potential load-transfer discontinuities [Assessment]
Readings : [Schierle2012], [Onouye2017]	

Unit 3: Natural Ventilation and Indoor Air Quality (8 hours)	
Competences Expected: AG-A08	
Topics	Learning Outcomes
• Drivers for natural ventilation: wind pressure coefficients (C_p), stack effect (buoyancy), and combined wind and stack; ventilation rate calculation using the orifice equation • Cross-ventilation and stack ventilation design: opening placement (inlet vs. outlet heights), room depth limits for effective cross-flow ($2-2.5 \times$ floor-to-ceiling height) • Indoor air quality standards and contaminants: ASHRAE 62.1 ventilation rate procedure, indoor pollutant sources (VOCs, CO₂, particulates), • Mixed-mode (hybrid) ventilation: sequencing strategies (changeover, zoned, concurrent), control logic for switching between natural and mechanical modes, • Airflow simulation for natural ventilation: computational fluid dynamics (CFD) for detailed analysis, zonal models for early design, and wind tunnel testing for complex geometries	• Describe the physical drivers of natural ventilation - wind and stack effect - and explain how opening size, placement, and building depth influence airflow rates [Familiarity] • Design a natural ventilation strategy for a building in a moderate climate, specifying opening sizes, heights, [Usage] • Evaluate a naturally ventilated building design using airflow simulation or simplified calculations, identifying zones with insufficient ventilation [Assessment]
Readings : [BrownDeKay2001]	

Unit 4: Building Systems and Assemblies (12 hours)	
Competences Expected: AG-A14	
Topics	Learning Outcomes
• Integration of building systems: coordinating structural frame, mechanical/electrical/plumbing (MEP), envelope, and interior fit-out within constrained floor-to-floor heights • Construction documentation for assemblies: details at 1:5, 1:10, and 1:20; section-through-wall details, sill and head conditions, and coordination between architectural • Construction tolerances and coordination: dimensional tolerances in concrete, steel, and masonry; clearances for MEP rough-in • Waterproofing and moisture management: below-grade waterproofing systems, drainage planes, vapor barriers, and flashing at penetrations • Fire-rated assemblies: UL-listed wall, floor, and ceiling assemblies; fire-stopping at penetrations, intumescent seals, and the architectural detailing required by fire codes • Prefabricated and modular assemblies: volumetric modular construction, panelized wall systems, and the design implications of off-site manufacturing tolerances	• Identify the principal building systems and describe how they are integrated and coordinated within a multi-story building assembly [Familiarity] • Develop construction-level details for a building assembly that correctly coordinate structural, envelope, and MEP systems within realistic tolerances and code requirements [Usage] • Evaluate a set of construction documents for assembly coordination quality, identifying conflicts, missing details, and buildability risks [Assessment]
Readings : [AllenIano2019]	

Unit 5: Building Codes, Accessibility, and Zoning (10 hours)	
Competences Expected: AG-A12	
Topics	Learning Outcomes
• Building codes and standards: IBC (International Building Code), IRC (International Residential Code), IFC (International Fire Code) • Means-of-egress and fire-evacuation route design: maximum travel distance to an exit, number and width of exits required by occupant load, exit discharge and assembly points, and diagramming evacuation routes on a life-safety plan • Accessibility codes: ADA Standards for Accessible Design, ICC A117.1, and local accessible building codes • Energy codes: IECC (International Energy Conservation Code), ASHRAE 90.1; prescriptive vs. performance paths • Zoning and land use regulations: zoning districts (residential, commercial, industrial, mixed-use), floor area ratio (FAR), lot coverage, setbacks, height limits • Permitting process: building permit, variance, special exception; code interpretation appeals; the architect's role in preparing permit sets, responding to plan review comments	• Describe the key provisions of building codes that affect architectural design - occupancy classification, means of egress, fire-resistance, accessibility, and energy performance [Familiarity] • Apply IBC occupancy and construction type tables to determine allowable building area and height for a given use and sprinkler status, [Usage] • Evaluate a building design's code compliance for accessibility (ADA) and life safety (IBC), identifying violations and recommending code-conforming modifications [Assessment]
Readings : [ChingCodes2017]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

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8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

ID201. Technical and professional English III (Mandatory)

2. GENERAL INFORMATION

- 2.1 Course** : ID201. Technical and professional English III
2.2 Semester : 4th Semester.
2.3 Credits : 2
2.4 Hours : 1 HT; 2 HP;
2.5 Duration of the period : 16 weeks
2.6 Type of course : Mandatory
2.7 Learning modality : Face to face
2.8 Prerequisites : ID102. Technical and professional English II. (3rd Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

At this level, students engage with English as the primary medium for accessing and producing technical content in computing, engineering, and the sciences. Grammar structures are applied to reading scientific articles, writing technical reports, describing engineering processes, and participating in professional discussions. The course bridges everyday English fluency with the demands of technical communication.

5. GOALS

- Train students to read, understand, and produce technical communication in English.
- Provide linguistic tools for connecting ideas in descriptive and analytical writing about computing and engineering.

6. COMPETENCES

No items for this table

7. TOPICS

Unit 1: Technical Communication (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Review of Tenses: Present, Past, and Future in technical documentation. • Interrogative sentences with complex Wh- questions for system analysis. • Words with more than one meaning in technical contexts (Polysemy). • Expressions for describing professional activities and research interests.	• By the end of the unit, students use various tenses to exchange detailed technical information and formulate precise questions about computing systems and engineering processes.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 2: Comparing Architectures (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Use of "What's it like?": Describing system characteristics and interfaces. • Advanced comparative and superlative adjectives in benchmark analysis. • Collocations in computing: high-performance, low-level, fault-tolerant. • Reading: Architecture comparison reports (RISC vs. CISC, SQL vs. NoSQL).	• Students analyze and describe differences between computing architectures, frameworks, and systems using varied comparative structures with technical precision.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 3: Then and Now in Computing (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Present Perfect vs. Simple Past: Contrasting historic events with current state. • Time expressions: for, since, ever, never applied to technology evolution. • Adverbs of time and manner in scientific narrative. • Vocabulary: Generations of technology, legacy systems, current platforms.	• Students differentiate and correctly apply the present perfect and the simple past to narrate the evolution of computing technologies and contrast historical achievements with the current state of the field.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 4: Engineering Standards and Protocols (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Modals of obligation and permission: Have to, Must, Can in professional norms. • Giving technical recommendations: Should, Ought to — code reviews and design. • Vocabulary: IEEE/ACM standards, coding conventions, security policies. • Formal writing: Technical memos and engineering recommendations.	• Students express engineering rules, standards, and professional recommendations using appropriate modal verbs in formal technical writing and peer discussion.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 5: How Systems Are Built (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Passive Voice: Present and Simple Past to describe engineering processes. • Vocabulary: Manufacturing, deployment, integration, and testing. • Expressions for giving technical opinions and discussing design trade-offs. • Writing: Process description for a software or hardware system.	• Students use the passive voice to describe how systems are designed, built, tested, and deployed, participating in technical discussions about engineering processes.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 6: Debugging and Analysis (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Past Continuous vs. Simple Past in incident and failure reports. • Narrative and sequence connectors: while, when, suddenly, as a result. • Vocabulary: Bugs, exceptions, crashes, logs, root cause analysis. • Writing: Incident report for a software or network failure.	• Students narrate debugging sessions, system failures, and experimental incidents using narrative tenses and technical sequencing connectors fluently.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 7: Research and Innovation (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Future Forms: Will, Going to, Present Continuous for research projection. • Expressions of probability and certainty in scientific contexts. • Vocabulary: Innovation cycles, research proposals, technology forecasting. • Oral presentations: "The future of computing in my field".	• Students project research goals and discuss future directions in computing and engineering using various future structures with appropriate degrees of certainty.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 8: Technical English III (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Programming and Web Development terminology: functions, APIs, frameworks. • User Interface (UI/UX) descriptions and usability concepts. • Basic project management vocabulary: sprints, milestones, deliverables. • Writing: Simple technical specification or README document.	• By the end of the course, students use specialized software development vocabulary to describe logical and functional components and produce basic technical documentation in English.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

AR2D2. Design Studio V (Mandatory)

2. GENERAL INFORMATION

2.1 Course	: AR2D2. Design Studio V
2.2 Semester	: 5 th Semester.
2.3 Credits	: 4
2.4 Hours	: 4 HT; 4 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Mandatory
2.7 Learning modality	: Face to face
2.8 Prerequisites	: AR2D1. Design Studio IV. (4 th Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

Design Studio V: Educational/Cultural Building develops a medium-scale building with a markedly more complex program than Design Studio IV (AR2D1, prerequisite) – a school, library, or small cultural center – in which an explicit long-span structural system and a deliberately performance-driven design process generate, rather than merely accommodate, the architectural proposal. The studio asks students to resolve daylight, acoustic, and mechanical comfort criteria for spaces with specific performance requirements (classrooms, auditoria, galleries), and to detail a high-performance building envelope that supports those criteria. This course is the foundation for Design Studio VI (AR2D3).

5. GOALS

- Design a long-span structural system (trusses, arches, shells, or space frames) appropriate to the spatial requirements of a mid-sized educational or cultural building.
- Integrate environmental and structural performance criteria as generative drivers of the design proposal from the earliest design stages.
- Design apertures and shading for adequate daylight performance in classrooms, galleries, and other program-specific spaces.
- Resolve acoustic performance requirements (reverberation, isolation) appropriate to the program's specific spaces.
- Select and coordinate mechanical (HVAC) systems with the architectural design.
- Detail a high-performance building envelope that supports the building's daylight, thermal, and acoustic performance goals.

6. COMPETENCES

- AG-A08)** Understands the structural and environmental design problems associated with construction and the engineering of building design. (Usage)
- AG-A11)** Demonstrates knowledge of the physical problems and technologies that allow buildings to provide internal comfort and protection within environmental parameters. (Usage)
- AG-A14)** Possesses creative capacity in construction techniques, grounded in a comprehensive understanding of the disciplines and construction methods related to architecture. (Usage)

7. TOPICS

Unit 1: Long-Span and Special Structures (10 hours)	
Competences Expected: AG-A08	
Topics	Learning Outcomes
• Arches and vaults: funicular compression geometry, buttressing requirements, ribbed vs. continuous vaults, and historic and contemporary applications (Guastavino, Candela) • Domes and shells: membrane theory, edge ring forces, buckling in thin shells, geodesic domes (Fuller), and reinforced concrete shells (Nervi, Isler) • Space frames and long-span trusses: three-dimensional truss action, node design, modular systems (Mero, Unistrut), and application in arenas, airports, and exhibition halls • Tensile and cable structures: cable nets (Frei Otto), fabric membranes (PTFE-coated fiberglass, ETFE), masts and anchorage design, and form-finding via physical • Folded plate structures: corrugated geometry for stiffness, folded plate concrete roofs, and timber folded plate systems (CLT folded plates) • Deployable and transformable structures: scissor linkages, pantographic systems, and their application in retractable roofs, emergency shelters, and kinetic architecture	• Describe the principal long-span structural systems - arches, domes, space frames, tensile membranes - and identify the appropriate span range [Familiarity] • Select and conceptualize a long-span structural system for a given program (e.g., stadium, airport terminal, convention center), justifying the choice by span, load, [Usage] • Evaluate the structural efficiency and architectural expression of a built long-span structure, analyzing its load path, stability, and integration of form with structural logic [Assessment]
Readings : [Schierle2012]	

Unit 2: Performance-Driven Design (10 hours)	
Competences Expected: AG-A08	
Topics	Learning Outcomes
- Integration of performance criteria into early design: using daylighting, solar access, thermal comfort, and structural efficiency as spatial - Simulation-based design feedback: using tools such as Ladybug, Honeybee, and Grasshopper to evaluate energy, daylight, - Passive design strategies: solar shading, natural ventilation, thermal mass, and orientation as architectural design elements that reduce mechanical energy loads - Structural form-finding as design: integrating structural logic (arches, shells, trusses, tensile systems) into spatial and formal decisions from schematic design onward - Building performance metrics and certification frameworks: EUI (energy use intensity), daylight autonomy, thermal comfort indices (PMV, SET), - AI-assisted performance optimization: generative adversarial networks and reinforcement learning for multi-objective design optimization	- Identify the key environmental and structural performance criteria relevant to a design project and describe how they can inform early-stage spatial and formal decisions [Familiarity] - Apply passive design strategies and simulation feedback to develop a performance-informed architectural proposal that meets defined energy and comfort targets [Usage] - Evaluate a building design for environmental and structural performance using simulation outputs and standard metrics, and propose targeted design improvements [Assessment]
Readings : [Lechner2014]	

Unit 3: Daylighting and Visual Comfort (8 hours)	
Competences Expected: AG-A11	
Topics	Learning Outcomes
- Daylight performance metrics: daylight factor (DF), spatial daylight autonomy (sDA), annual sunlight exposure (ASE), useful daylight illuminance (UDI), and glare indices (DGP, DGI) - Aperture design for daylight: window-to-wall ratio (WWR), head height, sill height, clerestories, sawtooth roofs, light shelves, - Shading integration for glare and cooling: fixed (overhangs, fins, louvers), operable (roller shades, venetian blinds, screens), - Daylight simulation tools: climate-based modeling (Radiance, DIVA, ClimateStudio, Ladybug Tools); annual simulation for LEED and other certification credits - Electric lighting integration: daylight harvesting controls (dimming, stepped switching), task-ambient lighting strategies,	- Describe the principal daylight performance metrics (sDA, ASE, UDI) and explain how they inform aperture and shading design decisions [Familiarity] - Design and simulate a daylighting strategy for a building facade or roof aperture, iterating on WWR, orientation, and shading to meet defined sDA and ASE targets [Usage] - Evaluate a building's daylighting design from simulation outputs, identifying areas of glare or insufficient illuminance [Assessment]
Readings : [Lechner2014]	

Unit 4: Acoustics and Noise Control (8 hours)	
Competences Expected: AG-A11	
Topics	Learning Outcomes
• Sound measurement metrics: sound pressure level (SPL, dB), A-weighting (dBA), reverberation time (RT_{60}), sound transmission class (STC), impact insulation class (IIC), • Absorption and diffusion: porous absorbers (fiber-glass, foam), resonant absorbers (perforated panels, membrane), and diffusers (quadratic residue, binary amplitude) • Sound isolation and flanking paths: mass-law, double-wall and decoupled assemblies, sealed penetrations, gasketed doors, floating floors, • Room acoustic design: calculating RT_{60} from volume and absorption, early decay time (EDT), clarity (C50, C80), and speech intelligibility (STI) for auditoria, classrooms, • Noise control from external sources: site planning for noise barriers, facade STC selection based on exterior noise levels (road, rail, air),	• Describe the key acoustic metrics (STC, IIC, RT_{60}, NC) and explain how each influences the design of building assemblies and room finishes [Familiarity] • Design a wall and floor-ceiling assembly to meet a specified STC and IIC rating, detailing flanking path controls and penetrations to achieve target isolation [Usage] • Evaluate a room's acoustic design by calculating its reverberation time and comparing it to recommended values for its intended use (lecture, music, conferencing) [Assessment]
Readings : [MehtaAcoustics1999]	

Unit 5: Mechanical Systems (HVAC) (8 hours)	
Competences Expected: AG-A11	
Topics	Learning Outcomes
• HVAC system classification: all-air (VAV, CAV, dual-duct), all-water (fan-coil, radiant), air-water (induction), and decentralized (heat pumps, PTAC, split systems) • Thermal zoning and load calculation: zone definition by orientation, occupancy, and use; heating and cooling load components (sensible, latent); peak load vs. part-load performance • Distribution system integration: ceiling plenum depth for ducts, raised floors for underfloor air distribution (UFAD), vertical riser coordination, • Dedicated outdoor air systems (DOAS) and energy recovery: enthalpy wheels, run-around loops, and heat pipes • High-efficiency HVAC technologies: variable refrigerant flow (VRF), chilled beams (active and passive), displacement ventilation, radiant heating and cooling slabs,	• Identify the principal HVAC system types and describe the architectural implications of each in terms of floor-to-floor height, ceiling plenum, mechanical room space, [Familiarity] • Select an appropriate HVAC system type for a building program and climate zone, integrating thermal zoning and distribution layout into the architectural floor plan and section [Usage] • Evaluate the HVAC system layout of a building for efficiency, constructability, and architectural integration [Assessment]
Readings : [Lechner2014]	

Unit 6: Facade and Building Envelope Technology (12 hours)	
Competences Expected: AG-A14	
Topics	Learning Outcomes
- Envelope performance criteria: thermal transmittance (U-value), solar heat gain coefficient (SHGC), air infiltration, acoustic transmission loss, - Glazing systems: double and triple glazing, low-e coatings, electrochromic and thermochromic glass, structural silicone glazing, and point-fixed glazing - Curtain wall and rainscreen systems: pressure-equalized rainscreen principle, back-ventilated facades, unitized curtain wall panels, and the detailing of movement joints - Insulation and airtightness: continuous insulation strategies for thermal bridge elimination, air barrier systems, blower-door testing, and Passivhaus envelope standards - Opaque wall systems: masonry veneer, EIFS, pre-cast concrete panels, metal panels, and fiber cement; fire rating, moisture management, and structural attachment for each system - Responsive and dynamic facade systems: kinetic facades (louvered, origami, pneumatic), electrochromic and BIPV panels, and media facades	- Describe the main types of building envelope systems and their performance characteristics, including thermal, moisture, acoustic, and solar control properties [Familiarity] - Select and detail an appropriate building envelope system for a specific climate and building program, justifying the choice in terms of performance, cost, and constructability [Usage] - Evaluate a facade design for thermal, moisture, and solar performance, identifying deficiencies in detailing and proposing improvements to meet defined performance targets [Assessment]
Readings : [AllenIano2019]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

AR400. Methodology of Research (Mandatory)

2. GENERAL INFORMATION

2.1 Course	: AR400. Methodology of Research
2.2 Semester	: 5 th Semester.
2.3 Credits	: 4
2.4 Hours	: 4 HT; 4 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Mandatory
2.7 Learning modality	: Face to face
2.8 Prerequisites	: 150Cr

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

Architectural Research Methodology equips students with the general methodological toolkit of architectural research before they begin the thesis sequence (Thesis I-III, AR401-AR403). The course covers quantitative research methods (surveys, experiments, statistical analysis), qualitative and ethnographic methods (interviews, observation, grounded theory), evidence-based design (translating research evidence into design decisions), and post-occupancy evaluation and building science (assessing measured building performance and user satisfaction). Unlike Thesis I (AR401), which applies research design, theoretical frameworks, and hypothesis formulation directly to each student's own thesis topic, this course builds the broader, topic-independent methods foundation that AR401 later draws on and specializes.

5. GOALS

- Design and critically evaluate quantitative research instruments (surveys, experiments, quasi-experiments) and apply descriptive and inferential statistics to architectural research questions.
- Conduct and analyze qualitative and ethnographic studies (interviews, focus groups, observation, grounded theory) to understand user experience and design processes.
- Apply an evidence-based design process – formulating a design question, searching and appraising evidence, and integrating it with design expertise – to inform architectural decisions.
- Conduct a post-occupancy evaluation of a building, combining user-satisfaction data with building-science measurements to assess the performance gap between design intent and measured outcomes.

6. COMPETENCES

- AG-A01)** Evaluates the impact of architectural solutions on sustainable development, economy, health and safety, the legal framework, architectural-urban heritage, and the environment. (Assessment)
- AG-A04)** Communicates effectively and inclusively with the architecture community and society through reports, design documentation, and presentations tailored to different audiences. (Assessment)
- AG-A10)** Conducts studies of complex problems using research methods, experimental design, data analysis, and information synthesis to reach valid conclusions. (Assessment)
- AG-A11)** Demonstrates knowledge of the physical problems and technologies that allow buildings to provide internal comfort and protection within environmental parameters. (Assessment)

7. TOPICS

Unit 1: Quantitative Methods in Architectural Research (10 hours)	
Competences Expected: AG-A04,AG-A10	
Topics	Learning Outcomes
• Survey design for architectural research: sampling methods (probability, convenience), questionnaire design (Likert scales, semantic differential), response rate optimization, • Experimental designs: true experiments (random assignment, control group), quasi-experiments (non-randomized, pre-post, time series), • Descriptive statistics: measures of central tendency (mean, median, mode), dispersion (standard deviation, range, interquartile range), • Inferential statistics: hypothesis testing (t-test, ANOVA, chi-square), correlation and regression (linear, multiple), and interpretation of p-values • Instrumentation for quantitative data collection: environmental sensors (temperature, light, CO_2), occupancy counters, objective performance measures (task completion time)	• Describe the main quantitative methods in architectural research - surveys, experiments, quasi-experiments - [Familiarity] • Design a survey or experiment to test a hypothesis about the effect of a design variable (lighting, color, layout) on user satisfaction, task performance, or behavior [Usage] • Evaluate a quantitative architectural study for sampling validity, statistical analysis appropriateness, and correct interpretation of p-values and effect sizes [Assessment]
Readings : [Creswell2018], [GroatWang2013], [Salkind2017]	

Unit 2: Qualitative and Ethnographic Methods (10 hours)	
Competences Expected: AG-A04,AG-A10	
Topics	Learning Outcomes
• Interviews and focus groups: structured vs. semi-structured vs. unstructured interviews, focus group dynamics, questioning strategies (probing, laddering), and recording • Ethnography and observation in architecture: participant observation (researcher as user), non-participant observation (fly-on-the-wall), time-sampling behavior mapping, • Content and thematic analysis: coding qualitative data (open coding, axial coding, selective coding), identifying themes • Grounded theory approach in architectural research: generating theory from data rather than hypothesis testing; constant comparative method • Case study methodology in architecture: single vs. multiple case design, case selection (typical, extreme, revelatory), data triangulation (documents, interviews, observations)	• Describe the main qualitative methods in architectural research - interviews, focus groups, ethnography, grounded theory - [Familiarity] • Conduct a qualitative study (interview, observation, or focus group) to investigate how users experience a built space, and analyze the data using thematic coding [Usage] • Evaluate the rigor of a qualitative architectural study based on credibility, transferability, dependability, and confirmability criteria (Lincoln & Guba) [Assessment]
Readings : [Creswell2018Qual], [GroatWang2013], [Charmaz2014]	

Unit 3: Evidence-Based Design (10 hours)	
Competences Expected: AG-A01,AG-A04	
Topics	Learning Outcomes
- Evidence-based design (EBD) framework: formulating a clinical or design question, searching for best evidence (hierarchy of evidence), critically appraising evidence - Hierarchy of evidence in architecture: systematic reviews and meta-analyses, randomized controlled trials (RCTs) in healthcare design, quasi-experimental studies, case studies - Systematic reviews and meta-analysis in EBD: steps (protocol, search strategy, inclusion criteria, data extraction, synthesis), using PRISMA guidelines, - Practice guidelines from evidence: AIA Design Guidelines for Healthcare Facilities, WELL Building Standard evidence documentation, - Post-occupancy evaluation (POE) as evidence feedback: comparing design intent to measured outcomes (satisfaction, productivity, safety), feeding results into future projects,	- Describe the evidence-based design process: question formulation, evidence search, critical appraisal, integration, and outcome evaluation - [Familiarity] - Apply an evidence-based design approach to a specific design problem (e.g., patient room, classroom, open office), citing peer-reviewed studies to support key design decisions [Usage] - Evaluate a design claim or guideline for its evidence base, assessing the quality of cited studies (design, sample size, statistical significance) [Assessment]
Readings : [HamiltonWatkins2015], [Ulrich2008], [GroatWang2013]	

Unit 4: Post-Occupancy Evaluation and Building Science (10 hours)	
Competences Expected: AG-A04,AG-A11	
Topics	Learning Outcomes
- Post-occupancy evaluation (POE) methods: walkthroughs, surveys (POE questionnaire, BUS Methodology), focus groups, building diagnostics (energy metering, blower door), - User satisfaction metrics: thermal satisfaction, perceived air quality, acoustic satisfaction, lighting quality, visual comfort, privacy, control over environment, - Building performance gap: difference between predicted (energy model, design intent) and measured (energy use, comfort, IAQ) performance - Building science measurement techniques: thermal imaging for envelope performance, data loggers for T/RH, CO₂ monitors for IAQ, light meters for illuminance, - Closing the feedback loop: integrating POE findings into design guidelines, updating building energy models with measured data,	- Describe the methods of post-occupancy evaluation - surveys, walkthroughs, building diagnostics - and the concept of the building performance gap [Familiarity] - Conduct a post-occupancy evaluation of a building (survey, walkthrough, limited data logging), analyzing user satisfaction data alongside measured performance data to identify [Usage] - Evaluate a POE report for methodological rigor, representativeness of respondents, alignment of questions with design intent, and actionable recommendations for future design [Assessment]
Readings : [Preiser1988], [Baird1996], [GroatWang2013]	

8. WORKPLAN

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9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

ID202. Technical and professional English IV (Mandatory)

2. GENERAL INFORMATION

2.1 Course	: ID202. Technical and professional English IV
2.2 Semester	: 5 th Semester.
2.3 Credits	: 2
2.4 Hours	: 1 HT; 2 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Mandatory
2.7 Learning modality	: Face to face
2.8 Prerequisites	: ID201. Technical and professional English III. (4 th Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

At the intermediate level, students apply English to the full range of technical communication required in computing and engineering practice: reading research papers, writing structured technical documents, analyzing case studies, and engaging in professional dialogue. Grammar structures are taught through authentic computing and engineering contexts, reinforcing both linguistic competence and disciplinary knowledge.

5. GOALS

- Develop the ability to write and read structured technical documents in English.
- Bring the student to a more fluent and natural expression in technical and scientific English.
- Master vocabulary for computing, systems engineering, and applied sciences.

6. COMPETENCES

No items for this table

7. TOPICS

Unit 1: Best Practices and Ethics (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Modals of obligation and advice: Should, Must, Have to in engineering codes. • Prohibition and absence of obligation in software licensing and data privacy. • Vocabulary: Professional ethics, intellectual property, responsible AI. • Writing: Formal technical recommendation and policy documents.	• By the end of the unit, students correctly use modal auxiliaries to express engineering standards, ethical obligations, and professional recommendations in formal technical environments.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 2: Failures and Root Causes (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Past Perfect: Structure and use in root cause analysis and post-mortems. • Contrast between Simple Past, Continuous, and Perfect in failure timelines. • Vocabulary: System outages, security breaches, cascading failures. • Expressions for reporting information: reported speech in incident briefings.	• Students reconstruct complex failure timelines and root cause analyses by establishing clear chronological sequences through the use of past tense contrasts.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 3: If-Then Logic (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Conditionals Type 0, 1, and 2 applied to computing logic and engineering decisions. • Sentences with "If" and "Unless" for system constraints and requirements. • Vocabulary: Hypothetical scenarios, risk analysis, and optimization trade-offs. • Expressions of what-if design thinking: "If we used X, the system would..."	• Students pose real and hypothetical technical scenarios and their consequences, using conditional structures to reason about design choices and engineering decisions.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 4: Ongoing Research (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Present Perfect Continuous for describing research in progress. • Contrast between Simple and Continuous Present Perfect in scientific writing. • Vocabulary: Continuous integration, agile development, iterative research. • Word formation: Prefixes and suffixes in scientific and technical terminology.	• Students describe research activities and development processes that began in the past and continue into the present, emphasizing duration and iterative progress.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 5: Manufacturing and Deployment (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Passive Voice in all basic tenses for technical process descriptions. • Verbs with two objects in passive: data is sent to the server by the client. • Vocabulary: Hardware manufacturing, cloud deployment, CI/CD pipelines. • Writing: Technical description of a deployment or production process.	• Students use the passive voice across multiple tenses to describe technical processes where the action, system, or result is the focus rather than the agent.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 6: Tech Roadmaps (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Future Continuous and Future Perfect for project timelines and milestones. • Adverbs of probability: perhaps, probably, definitely — in tech forecasting. • Vocabulary: Product roadmaps, release planning, emerging research areas. • Oral presentations: "The state of AI / quantum computing in 5 years".	• Students project technical states, completed future milestones, and research outcomes, discussing computing and engineering roadmaps with advanced vocabulary.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 7: Technical Teams (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Indirect questions and Tag questions in technical interviews and peer reviews. • Common Phrasal Verbs in engineering and research environments. • Vocabulary: Collaboration tools, code review practices, team roles. • Writing: Short technical blog posts and engineering team updates.	• Students use polite inquiry forms and confirmation strategies in technical interviews and team discussions, improving their fluency and naturalness in professional engineering contexts.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

Unit 8: Technical English IV: Networks and Security (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Networking terminology: protocols, topologies, OSI model, routing. • Cybersecurity vocabulary: vulnerabilities, threats, encryption, authentication. • Reading and writing network incident and security audit reports. • Project: Security assessment plan for a computing infrastructure.	• By the end of the course, students command networking and cybersecurity technical terminology to read specialized documentation and communicate effectively with IT and security professionals in English.
Readings : [Soars022S], [Cambridge06], [MacGrew99]	

8. WORKPLAN

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9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

AR2D3. Design Studio VI (Mandatory)

2. GENERAL INFORMATION

2.1 Course	: AR2D3. Design Studio VI
2.2 Semester	: 6 th Semester.
2.3 Credits	: 4
2.4 Hours	: 4 HT; 4 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Mandatory
2.7 Learning modality	: Face to face
2.8 Prerequisites	: AR2D2. Design Studio V. (5 th Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

Design Studio VI: Mixed-Use Building raises the program and scale complexity introduced in Design Studio V (AR2D2, prerequisite) to a taller, mixed-use building that stacks residential, commercial, and/or civic uses and requires explicit coordination with building systems (structural, envelope, and MEP). Students design a building whose viability depends as much on development feasibility as on architectural resolution, and practice the project-management skills needed to carry a complex proposal from concept through a coordinated construction-ready design. This course is the foundation for the Urban Design Studio sequence that begins with Design Studio VII (AR3D1).

5. GOALS

- Design the programming and spatial organization of a mixed-use building at a scale and complexity greater than any single-use project in the sequence so far.
- Coordinate the structural, envelope, and building-system assemblies of a taller building within realistic floor-to-floor height constraints.
- Select an appropriate seismic lateral-force-resisting system and detail the ductility measures required for a mixed-use building of increased height.
- Evaluate the development feasibility of the proposed building – market, site, regulatory, and financial constraints – as part of the design process.
- Apply project-management principles (scope, schedule, budget) to the development of a complex design proposal.

6. COMPETENCES

AG-A05) Applies management principles and economic decision-making, considering risk, as a team member or leader, to manage projects in multidisciplinary environments. (Usage)

AG-A09) Creates architectural designs that satisfy aesthetic and technical requirements. (Usage)

AG-A12) Possesses the design skills needed to satisfy building users' requirements within cost constraints and building regulations. (Usage)

7. TOPICS

Unit 1: Large-Scale and Complex Buildings (12 hours)	
Competences Expected: AG-A09	
Topics	Learning Outcomes
• Programming and spatial organization at large scale: stacking diagrams, core-to-perimeter ratios, vertical circulation strategies, • Life safety and means of egress in large buildings: occupancy-based egress design, pressurized stairwells, refuge floors, fire compartmentalization, and NFPA/IBC requirements • Vertical transportation systems: elevator group design, sky lobbies, express/local zone strategies, escalators, and integration of vertical transport into building form • Hybrid and mixed-use building design: separating and linking residential, commercial, hotel, and civic programs; transfer floors, podium strategies, and shared amenity programming • Phased construction and building complexity: designing for construction staging, operational continuity, future expansion, and changeable use within long-lifespan complex buildings • Campus and master plan design at large scale: site organization, wayfinding, public realm, phasing, infrastructure coordination, and identity across a multi-building ensemble	• Identify the key design challenges - program complexity, life safety, vertical transport, and phasing - that distinguish large-scale buildings from smaller architectural projects [Familiarity] • Apply large-scale building design strategies to develop a spatial and programmatic organization for a complex multi-story or mixed-use building typology [Usage] • Evaluate a large-scale building design for programmatic coherence, life safety compliance, and operational efficiency [Assessment]
Readings : [Schierle2012]	

Unit 2: Building Systems and Assemblies (10 hours)	
Competences Expected: AG-A09	
Topics	Learning Outcomes
• Integration of building systems: coordinating structural frame, mechanical/electrical/plumbing (MEP), envelope, and interior fit-out within constrained floor-to-floor heights • Construction documentation for assemblies: details at 1:5, 1:10, and 1:20; section-through-wall details, sill and head conditions, and coordination between architectural • Construction tolerances and coordination: dimensional tolerances in concrete, steel, and masonry; clearances for MEP rough-in • Waterproofing and moisture management: below-grade waterproofing systems, drainage planes, vapor barriers, and flashing at penetrations • Fire-rated assemblies: UL-listed wall, floor, and ceiling assemblies; fire-stopping at penetrations, intumescent seals, and the architectural detailing required by fire codes • Prefabricated and modular assemblies: volumetric modular construction, panelized wall systems, and the design implications of off-site manufacturing tolerances	• Identify the principal building systems and describe how they are integrated and coordinated within a multi-story building assembly [Familiarity] • Develop construction-level details for a building assembly that correctly coordinate structural, envelope, and MEP systems within realistic tolerances and code requirements [Usage] • Evaluate a set of construction documents for assembly coordination quality, identifying conflicts, missing details, and buildability risks [Assessment]
Readings : [AllenIano2019]	

Unit 3: Seismic Design for Architecture (10 hours)	
Competences Expected: AG-A09	
Topics	Learning Outcomes
• Seismic hazards and site effects: fault rupture, ground shaking, liquefaction, landslide; site class effects on ground motion amplification • Lateral force-resisting systems for seismic resistance: moment frames, braced frames (concentric, eccentric), shear walls (reinforced concrete, wood), and dual systems • Ductility and capacity design: strong-column weak-beam, plastic hinge formation, confinement reinforcement in concrete columns, • Architectural integration of seismic systems: drift limits for cladding and partitions, seismic joints, diaphragm continuity, • Base isolation and energy dissipation: elastomeric and sliding bearings, tuned mass dampers, viscous dampers, and their impact on architectural detailing • Performance-based seismic design (PBSD): performance objectives (immediate occupancy, life safety, collapse prevention), nonlinear static pushover analysis,	• Describe the primary seismic force-resisting systems and explain how building codes classify seismic risk and prescribe detailing for ductile behavior [Familiarity] • Apply seismic design principles to the early-stage design of a building, selecting an appropriate lateral system and configuring plan [Usage] • Evaluate an architectural design for seismic vulnerability, identifying plan irregularities (re-entrant corners, diaphragm discontinuities) [Assessment]
Readings : [Schierle2012]	

Unit 4: Development Process and Feasibility (10 hours)	
Competences Expected: AG-A12	
Topics	Learning Outcomes
• Development phases: site identification, option agreement, due diligence, entitlement (zoning, permits), design • Due diligence for development sites: title review, environmental assessment (Phase I and II), geotechnical investigation, zoning analysis, utility availability, • Entitlements and permitting: land use approvals (re-zoning, variances, conditional use permits), building permits, impact fees (school, traffic, parks) • Feasibility study components: market support, site suitability, regulatory pathway, construction feasibility, financial pro forma (with sensitivity analysis), • Real estate pro forma basics: projected net operating income ($\text{NOI} = \text{gross potential rent} - \text{vacancy allowance} - \text{operating expenses}$), debt service coverage ratio (DSCR),	• Describe the major stages of the real estate development process - predevelopment, construction, lease-up, disposition - and the due diligence [Familiarity] • Prepare a feasibility study for a proposed development, including market analysis, site due diligence summary, entitlement pathway, construction cost estimate, [Usage] • Evaluate a development pro forma for financial viability, identifying understated risk (vacancy, construction contingency) [Assessment]
Readings : [MilesBerensWeiss2007]	

Unit 5: Project Management and Construction Economics (8 hours)	
Competences Expected: AG-A05	
Topics	Learning Outcomes
• Project management phases: initiation, planning, execution, monitoring/controlling, close-out; work breakdown structure (WBS), Gantt charts, critical path method (CPM), • Cost estimation methods: order-of-magnitude, schematic, design development, and construction document estimates • Value engineering (VE) in architecture: function analysis, cost-performance trade-offs, life cycle costing • Risk management for architectural projects: identifying design risks (code compliance, constructability), professional liability risks (errors and omissions), • Construction specifications: MasterFormat divisions (CSI), section organization (part 1: general, part 2: products, part 3: execution) • Construction quality management: quality plans and inspection/test plans (ITPs) aligned with ISO 9001, non-conformance reports (NCRs) and corrective actions, and compilation of the quality dossier (material certifications, test reports, inspection records, as-built verification) for project close-out	• Describe the key project management activities for an architectural project: scheduling, cost estimating, value engineering, risk management, and quality management, [Familiarity] • Prepare a project schedule (Gantt chart) for a design project, linking deliverables to phases, and produce a schematic-level cost estimate using assembly-based unit costs [Usage] • Evaluate a project's budget and schedule performance against the baseline, using earned value management (EVM) metrics to identify cost or schedule overruns [Assessment]
Readings : [Hendrickson1998]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

ID203. Technical and professional English V (Mandatory)

2. GENERAL INFORMATION

- 2.1 Course : ID203. Technical and professional English V
- 2.2 Semester : 6th Semester.
- 2.3 Credits : 2
- 2.4 Hours : 1 HT; 2 HP;
- 2.5 Duration of the period : 16 weeks
- 2.6 Type of course : Mandatory
- 2.7 Learning modality : Face to face
- 2.8 Prerequisites : ID202. Technical and professional English IV. (5th Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

A fundamental part of the integral formation of a professional is the ability to communicate in a foreign language in addition to the native language itself. In the engineering and computing career, technical English is the most critical tool for accessing the forefront of knowledge and research, writing scientific papers, participating in international conferences, and collaborating in global teams. This course brings students to the level of autonomous technical communicators capable of producing and critically evaluating academic and professional content.

5. GOALS

- Increase the ability and fluency to communicate complex technical ideas in English.
- Ensure that students interact with emphasis on scientific argumentation and advanced technical writing.
- Master vocabulary for software engineering, data science, and systems research.

6. COMPETENCES

No items for this table

7. TOPICS

Unit 1: Scientific Argumentation (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Advanced review of auxiliary verbs and verb tenses in academic writing. • Negative questions and emphatic answers in scientific debate. • Word formation: Prefixes and suffixes common in computing and science. • Correcting misconceptions: Refuting claims in technical discussions.	• By the end of the unit, students use auxiliaries and tenses precisely to construct scientific arguments, challenge erroneous technical claims, and engage in structured academic debate.
Readings : [Soars023S], [Soars023W], [Soars023T], [Cambridge06], [MacGrew99]	

Unit 2: Research Methodology (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Present Simple vs. Present Continuous: Distinguishing general facts from ongoing experiments. • State verbs and action verbs in experimental descriptions. • Vocabulary: Research design, experimental variables, data collection methods. • Writing: Description of a research method or experimental procedure.	• Students differentiate between stative and progressive uses to accurately describe scientific laws, ongoing experiments, and research methodologies in computing and engineering.
Readings : [Soars023S], [Soars023W], [Soars023T], [Cambridge06], [MacGrew99]	

Unit 3: Case Studies (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Narrative tenses: Simple Past, Past Continuous, and Past Perfect in case study analysis. • Structure of "Used to" and "Would" for describing legacy systems and past practices. • Vocabulary: Historical computing cases, paradigm shifts, engineering lessons learned. • Writing: Structured case study report on a computing incident or innovation.	• Students analyze and narrate sequences of technical events and historical computing cases fluently, applying narrative tenses correctly in professional case study reports.
Readings : [Soars023S], [Soars023W], [Soars023T], [Cambridge06], [MacGrew99]	

Unit 4: Research Proposals (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Predictions and plans: Future tense review for academic proposal writing. • Future Continuous and Future Perfect in project scope and outcomes. • Vocabulary: Research objectives, expected contributions, scope and limitations. • Writing: Short research proposal or technical project abstract.	• Students project research goals and anticipated outcomes, and make evidence-based predictions about the evolution of technology using appropriate future forms in formal academic writing.
Readings : [Soars023S], [Soars023W], [Soars023T], [Cambridge06], [MacGrew99]	

Unit 5: Technical Documentation (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
- Verb patterns (Verbs followed by -ing or infinitive) in instructional writing. - Expressions with "Like" for analogies and technical comparisons. - Vocabulary: API documentation, user manuals, technical specifications. - Debates: Standards for open-source documentation and reproducibility.	Students use complex verb patterns to write clear, precise technical documentation and use analogical reasoning to explain technical concepts to diverse audiences.
Readings : [Soars023S], [Soars023W], [Soars023T], [Cambridge06], [MacGrew99]	

Unit 6: Long-term Projects (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
- Present Perfect Continuous vs. Simple Present Perfect in research progress reports. - Modal verbs of deduction (Present and Past) for interpreting experimental results. - Vocabulary: Long-running systems, sustained research programs, startup development. - Oral presentations: "Progress report on a computing research project".	Students discuss long-term research and development activities, make deductions about technical outcomes, and present progress reports on computing projects with appropriate academic register.
Readings : [Soars023S], [Soars023W], [Soars023T], [Cambridge06], [MacGrew99]	

Unit 7: Advanced Technical Writing (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
- Relative clauses (Defining vs. Non-defining) in technical paper writing. - Advanced passive voice in formal scientific and engineering prose. - Vocabulary: Peer review, impact factors, citation practices, open access. - Writing: Abstract and introduction section of a computing research paper.	Students write precise, well-structured technical and scientific texts using relative clauses and advanced passive constructions to add depth and clarity to research writing.
Readings : [Soars023S], [Soars023W], [Soars023T], [Cambridge06], [MacGrew99]	

Unit 8: English for Software Engineering (12 hours)	
Competences Expected:	
Topics	Learning Outcomes
• Agile Methodologies: Scrum, Kanban, and XP terminology in English. • QA (Quality Assurance) and Testing: Test plans, bug reports, acceptance criteria. • Software requirements documentation: user stories, use cases, specifications. • Simulation: Technical team meeting (Sprint planning and retrospective).	• By the end of the course, students command software engineering and project management terminology, can produce professional technical documents, and actively participate in international technical meetings and reviews in English.
Readings : [Soars023S], [Soars023W], [Soars023T], [Cambridge06], [MacGrew99]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

AR3D1. Design Studio VII (Mandatory)

2. GENERAL INFORMATION

2.1 Course	: AR3D1. Design Studio VII
2.2 Semester	: 7 th Semester.
2.3 Credits	: 4
2.4 Hours	: 4 HT; 4 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Mandatory
2.7 Learning modality	: Face to face
2.8 Prerequisites	: AR2D3. Design Studio VI. (6 th Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

Urban Design Studio VII: Public Space and Landscape shifts the sequence's scale of operation from the single building, the focus of Design Studio VI (AR2D3, prerequisite), to the city: streets, blocks, public space, and the urban tissue that frames every building the students have designed so far. Students analyze the morphology of an existing urban fabric and the planning frameworks (zoning, master-planning, contemporary urban theory) that shape it, then propose an urban design and landscape intervention at the scale of a public space, a street, or a neighborhood. The course is the foundation for Design Studio VIII (AR3D2), the first of the two more specialized, higher-complexity studios that close the sequence.

5. GOALS

- Analyze the morphology of an existing urban fabric – streets, blocks, plots, and urban typologies – as the basis for an urban design proposal.
- Apply contemporary planning methods and urban theory (zoning, master vs. strategic planning, public participation) to a real urban design problem.
- Design public open space and landscape – parks, plazas, streets – integrating ecological, social, and cultural functions.
- Apply landscape design principles (site analysis, spatial organization, circulation) and the integration of landscape with urban green infrastructure.
- Design across urban design scales – from the regional structure down to the block and the street – applying the design guidelines appropriate to each.

6. COMPETENCES

- AG-A01)** Evaluates the impact of architectural solutions on sustainable development, economy, health and safety, the legal framework, architectural-urban heritage, and the environment. (Usage)
- AG-A13)** Demonstrates knowledge of the means to achieve ecologically responsible design and environmental conservation and rehabilitation. (Usage)
- AG-A15)** Understands the relationship between people, buildings, and their environment, and the need to relate buildings and spaces to human scale and needs. (Usage)

7. TOPICS

Unit 1: Urban Form and Morphology (8 hours)	
Competences Expected: AG-A01	
Topics	Learning Outcomes
• Kevin Lynch's city image elements: paths, edges, districts, nodes, and landmarks; their role in legibility and wayfinding; application to urban design analysis and intervention • Street, block, and plot systems: typologies (grid, radial, organic, cul-de-sac), block dimensions and permeability, plot subdivision, • Urban building typologies: single-family detached, row house (townhouse), courtyard building, slab, point tower, and linear block • Morphological analysis methods: Conzenian (burge cycle, fringe belts), space syntax (integration, connectivity, choice), and figure-ground diagrams for reading urban form • Urban fabric layers: plot subdivision history, street network evolution, land use succession, and the persistence of plot boundaries over centuries as a design constraint	• Identify the key morphological elements of a city - streets, blocks, plots, buildings - and describe the relationships among them that define urban character [Familiarity] • Apply morphological analysis tools (figure-ground, space syntax) to an urban sector, identifying its legibility, connectivity, and typological diversity [Usage] • Evaluate the morphological coherence and permeability of a proposed urban design, comparing block sizes, street connectivity, [Assessment]
Readings : [KropfMorphology2017]	

Unit 2: Contemporary Planning Methods and Theory (10 hours)	
Competences Expected: AG-A01	
Topics	Learning Outcomes
• Planning methods: zoning (Euclidean, form-based, performance-based), master planning vs. strategic planning, public participation (charrettes, community workshops) • Smart growth and new urbanism: principles (transit-oriented development, walkability, mixed-income housing, urban growth boundaries), Andrés Duany's transect, • Contemporary urban theory: Lefebvre's production of space, Harvey's right to the city, Sennett's open city, and the role of informality, participation, • Integration of civil engineering technical constraints (structural, geotechnical, utility infrastructure, and transportation) into urban planning and architectural design frameworks; the collaborative role of civil engineers in multidisciplinary building and urban project teams	• Apply a planning method - such as form-based coding or scenario planning - to a specific urban site, producing land use or built form regulations that align with stated policy [Usage] • Evaluate a current urban plan or zoning code against contemporary planning principles (walkability, mixed-use, transit orientation, social equity), identifying strengths [Assessment]
Readings : [Jacobs1961], [Gehl2010]	

Unit 3: Urban Design at Multiple Scales (10 hours)	
Competences Expected: AG-A15	
Topics	Learning Outcomes
- Regional and city scale: transit corridors, green belts, growth boundaries, satellite towns, and the relationship between density - Neighborhood scale: walkability (5-10 minute walking radius), mixed-use zoning, social infrastructure (schools, clinics, community centers), and the 20-minute neighborhood concept - Block and street scale: block length for pedestrian permeability (80-120 m max), street section design (lane widths, sidewalks, bike lanes, street trees, furniture zone), - Public space design: squares, plazas, parks, pocket parks, and streets as public space; William Whyte's elements of successful public space (sittable space, sun, food - Urban design guidelines: building setbacks, height limits, architectural character, facade articulation, signage, lighting,	- Describe the key design considerations at each urban scale - regional, neighborhood, block, street, and public space - [Familiarity] - Develop a set of urban design guidelines for a specific neighborhood or street typology, integrating density, building height, block length, street section, [Usage] - Evaluate an urban design project for its multi-scale coherence, assessing how well it integrates regional transit, neighborhood walkability, block permeability, street safety, [Assessment]
Readings : [Lynch1960]	

Unit 4: Landscape and Open Space Design (8 hours)	
Competences Expected: AG-A13	
Topics	Learning Outcomes
- Park types and their urban roles: pocket parks, neighborhood parks, district parks, regional parks, linear parks (greenways), waterfront parks, and national urban parks - Green infrastructure in urban design: bioswales, rain gardens, permeable pavements, urban forests, and green roofs - Placemaking for public space: Project for Public Spaces criteria (sociability, uses/activities, access, comfort/image) - Integration of landscape and urban form: view corridors, public space networks, park-to-park connections, and the role of open space in structuring urban density and walkability - Equity in open space access: distributional equity (distance, size per capita), quality equity (facilities, safety, maintenance),	- Describe the typologies of urban open space and their appropriate spatial distribution, programming, and ecological functions [Familiarity] - Design a public open space (plaza, park, or greenway) that integrates stormwater management, seating, shade, and circulation into a coherent spatial composition [Usage] - Evaluate a public space design using placemaking criteria (access, comfort, activities, sociability) and identify modifications to improve its use frequency and user diversity [Assessment]
Readings : [Booth1983]	

Unit 5: Landscape Design Principles and Process (10 hours)	
Competences Expected: AG-A13	
Topics	Learning Outcomes
• Site analysis for landscape: topography (slope, aspect), soils (texture, drainage, fertility), hydrology (surface flow, groundwater, flood zones), vegetation, microclimate (sun) • Spatial organization in landscape design: rooms (outdoor rooms), edges (soft vs. hard), sequence (entry, discovery, culmination), focal points (gazebo, sculpture, specimen tree) • Circulation in landscape: primary (vehicular, bike), secondary (pedestrian), service (maintenance), accessible routes (ADA gradients, surface firmness), • Landscape architectural drawing: site plans, grading plans, planting plans, irrigation plans, construction details (walls, paving, water features), • View analysis and visual impact: key views (from building, from approach), framed views, borrowed views, screening of undesirable views, and the use of massing	• Describe the elements of landscape site analysis and the spatial organization principles of outdoor rooms, edges, and circulation [Familiarity] • Produce a landscape design concept for a small site, integrating site analysis data into a spatial layout with defined outdoor rooms, circulation, and focal points [Usage] • Evaluate a landscape design for its responsiveness to site conditions (topography, hydrology, vegetation) and user needs, identifying strengths and weaknesses in circulation [Assessment]
Readings : [Booth1983]	

Unit 6: Urban Landscape and Green Infrastructure (8 hours)	
Competences Expected: AG-A13	
Topics	Learning Outcomes
• Green infrastructure types at urban scale: green roofs (extensive, intensive, biodiverse), rain gardens, bioswales, permeable alleys, street tree trenches, constructed wetlands • Urban forestry: street tree species selection (structural integrity, salt tolerance, root behavior), spacing and placement for shade • Water-sensitive urban design: integrating stormwater management with landscape aesthetics, water reuse for irrigation, • Urban heat island mitigation via landscape: cool pavements (high albedo), shading from street trees and green structures, evapotranspirative cooling from green roofs • Green networks and ecological corridors: connecting parks and open spaces for wildlife movement, integrating greenways along waterways,	• Describe the types of green infrastructure used in urban landscapes - green roofs, rain gardens, bioswales, tree trenches - [Familiarity] • Design a green infrastructure intervention for an urban site (plaza, street, rooftop) that manages a specified stormwater volume, reduces surface temperature, and provides amenity [Usage] • Evaluate the performance of an existing green infrastructure installation against design goals (stormwater capture, plant survival, user acceptance) [Assessment]
Readings : [Gehl2010]	

8. WORKPLAN

8.1 Methodology

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9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

AR3D2. Design Studio VIII (Mandatory)

2. GENERAL INFORMATION

2.1 Course	: AR3D2. Design Studio VIII
2.2 Semester	: 8 th Semester.
2.3 Credits	: 4
2.4 Hours	: 4 HT; 4 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Mandatory
2.7 Learning modality	: Face to face
2.8 Prerequisites	: AR3D1. Design Studio VII. (7 th Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

Design Studio VIII: Heritage and Complex Project follows the urban scale of Urban Design Studio VII (AR3D1, prerequisite) with a return to the building scale, now at a markedly higher level of complexity: students choose between the adaptive reuse of a historic building, or a large institutional project, as the specialization axis of this studio. The heritage track introduces the philosophical foundations and documentation methods of architectural conservation, the structural assessment of existing historic fabric, and the design strategies for adapting a historic building to new uses, including circular-economy principles for material reuse. This course is the foundation for Design Studio IX (AR3D3).

5. GOALS

- Apply the philosophical foundations and charters of architectural conservation (authenticity, integrity, minimal intervention) to the evaluation of a historic building or site.
- Document a historic building using appropriate survey methods (measured drawing, photogrammetry, or laser scanning) as the basis for a conservation or reuse proposal.
- Assess the structural condition of an existing historic building using non-destructive testing and monitoring methods.
- Design an adaptive reuse or large-scale institutional proposal that reconciles conservation principles (or complex-program integration) with contemporary programmatic requirements.
- Apply circular-economy principles – material reuse, design for disassembly – to the technical resolution of the design proposal.

6. COMPETENCES

- AG-A01)** Evaluates the impact of architectural solutions on sustainable development, economy, health and safety, the legal framework, architectural-urban heritage, and the environment. (Usage)
- AG-A10)** Conducts studies of complex problems using research methods, experimental design, data analysis, and information synthesis to reach valid conclusions. (Usage)
- AG-A14)** Possesses creative capacity in construction techniques, grounded in a comprehensive understanding of the disciplines and construction methods related to architecture. (Usage)

7. TOPICS

Unit 1: Theory and Philosophy of Conservation (8 hours)	
Competences Expected: AG-A01	
Topics	Learning Outcomes
• Historic conservation charters: Venice Charter (1964) - principles of minimum intervention, reversibility, anastylosis • Philosophical debate in conservation: Ruskin's anti-restoration (building as ruin), Viollet-le-Duc's stylistic restoration (unity of style), Morris • Core conservation principles: minimum intervention, reversibility, distinguishability of new work, compatibility of materials, documentation, • Values-based conservation: assigning values (historic, aesthetic, social, scientific, economic) and managing change through a conservation management plan • Authenticity and integrity: authenticity of form, material, design, setting, and use; integrity as the intactness of the historic resource • Peru's Ley 28296 (Ley General del Patrimonio Cultural de la Nación): legal protection of heritage-declared buildings and sites, and the Ministerio de Cultura's authorization requirements for interventions on protected fabric	• Describe the key conservation charters (Venice, Burra, Nara) and their principles: minimum intervention, reversibility, authenticity, and cultural significance [Familiarity] • Apply a values-based conservation framework to a historic building or site, identifying its cultural, historic, and social values [Usage] • Critically evaluate a conservation intervention proposal against the principles of the Venice and Burra Charters, assessing it for reversibility, compatibility, [Assessment]
Readings : [Feilden2003]	

Unit 2: Adaptive Reuse and Building Transformation (10 hours)	
Competences Expected: AG-A01	
Topics	Learning Outcomes
• Adaptive reuse strategies: conversion of industrial buildings (warehouse, factory, mill) to residential, office, or cultural use; religious buildings to community space • Designing additions to historic buildings: approach of contrast (Neue Nationalgalerie, Kolumba Museum) vs. • Interior adaptation of heritage buildings: inserting new floors and mezzanines, glazed interior partitions for program separation without structural change, MEP • Material reuse in adaptation: salvaged timber, brick, stone, and fixtures as design features; sourcing from deconstruction • Code compliance in heritage adaptation: equivalency provisions (IBC Chapter 34, existing buildings), alternative means and methods, structural upgrades for seismic,	• Describe the principal strategies for adaptive reuse of industrial, religious, and infrastructural heritage [Familiarity] • Develop an adaptive reuse proposal for a historic building, including program analysis, insertion strategy (interior interventions, addition), [Usage] • Evaluate an adaptive reuse project for its success in balancing heritage conservation with new program requirements, assessing the reversibility [Assessment]
Readings : [Stubbs2009]	

Unit 3: Historic Documentation and Digital Survey (8 hours)	
Competences Expected: AG-A10	
Topics	Learning Outcomes
- Measured drawing of historic buildings: hand measuring (tape, laser distometer) to produce scaled plans, sections, and elevations - Close-range photogrammetry: capturing overlapping images, processing with software (Agisoft Metashape, RealityCapture), generating 3D point clouds, meshes, - Terrestrial laser scanning (TLS): time-of-flight and phase-shift scanners, registration, point cloud processing, and extraction of 2D drawings from 3D point clouds - Drone-based documentation: aerial photogrammetry and LiDAR for roof, facade, and site topography; flight planning, ground control points (GCPs), - Condition assessment and monitoring: mapping decay patterns (efflorescence, spalling, cracking, biological growth) on drawings or point clouds	- Describe the principal methods for documenting historic buildings - measured drawing, photogrammetry, laser scanning, and drone survey - and their appropriate scales [Familiarity] - Produce measured drawings of a historic building or element using hand measurement, photogrammetry, or point cloud extraction, noting areas of material decay [Usage] - Evaluate a documentation survey plan for a historic building, assessing the choice of method (photogrammetry vs [Assessment]
Readings : [Feilden2003]	

Unit 4: Structural Assessment of Historic Buildings (8 hours)	
Competences Expected: AG-A10	
Topics	Learning Outcomes
- Non-destructive testing (NDT) for heritage: rebound hammer, ultrasonic pulse velocity (UPV), moisture meters, endoscopy, thermal imaging, - Small-sample and minimally invasive testing: core sampling for compressive strength, mortar analysis (chemical composition, binder/aggregate ratio), timber dendrochronology, - Structural monitoring of historic buildings: crack monitoring (glass telltales, mechanical gauges, electronic displacement sensors), tilt meters, - Structural modeling for heritage: interpreting historic construction techniques (masonry vaults, timber frames, iron elements), simplified analysis (limit state for masonry), - Decay mechanisms in historic structures: differential settlement, thrust from vaults, water ingress (freeze-thaw, salt crystallization), timber decay (rot, insect attack),	- Describe the principal non-destructive testing methods for historic building assessment and identify the decay mechanisms commonly found in historic masonry, timber, [Familiarity] - Develop a structural assessment plan for a historic building, selecting appropriate NDT and monitoring methods based on materials, decay patterns, and suspected failure mechanisms [Usage] - Evaluate the structural condition of a historic building from monitoring data and on-site observations, diagnosing the likely causes of cracking or deformation [Assessment]
Readings : [Feilden2003]	

Unit 5: Large-Scale and Complex Buildings (12 hours)	
Competences Expected: AG-A14	
Topics	Learning Outcomes
• Programming and spatial organization at large scale: stacking diagrams, core-to-perimeter ratios, vertical circulation strategies, • Life safety and means of egress in large buildings: occupancy-based egress design, pressurized stairwells, refuge floors, fire compartmentalization, and NFPA/IBC requirements • Vertical transportation systems: elevator group design, sky lobbies, express/local zone strategies, escalators, and integration of vertical transport into building form • Hybrid and mixed-use building design: separating and linking residential, commercial, hotel, and civic programs; transfer floors, podium strategies, and shared amenity programming • Phased construction and building complexity: designing for construction staging, operational continuity, future expansion, and changeable use within long-lifespan complex buildings • Campus and master plan design at large scale: site organization, wayfinding, public realm, phasing, infrastructure coordination, and identity across a multi-building ensemble	• Identify the key design challenges - program complexity, life safety, vertical transport, and phasing - that distinguish large-scale buildings from smaller architectural projects [Familiarity] • Apply large-scale building design strategies to develop a spatial and programmatic organization for a complex multi-story or mixed-use building typology [Usage] • Evaluate a large-scale building design for programmatic coherence, life safety compliance, and operational efficiency [Assessment]
Readings : [Stubbs2009]	

Unit 6: Circular and Recycled Materials (8 hours)	
Competences Expected: AG-A14	
Topics	Learning Outcomes
• Circular economy in construction: the hierarchy of reuse (refurbish, repurpose, recycle, recover); Ellen MacArthur Foundation framework applied to building materials and components • Design for disassembly: reversible connections (bolted vs. welded, dry vs. wet joints), accessible fasteners, standardized component dimensions, • Material passports and digital product declarations: documenting material composition, structural properties, and reuse potential • Recycled content specifications: recycled steel (EAF vs. BF), recycled concrete aggregate (RCA), reclaimed timber, • Adaptive reuse technical assessment: structural capacity evaluation of existing buildings, floor-to-floor height compatibility for new uses, facade retention feasibility, • Urban mining and deconstruction: selective demolition methodologies, material recovery rates, contamination testing,	• Describe the principles of circular construction, including design for disassembly, material passports, and recycled content specification, [Familiarity] • Apply circular economy principles to a building design, specifying recycled and reclaimed materials and designing connections and assemblies that support future disassembly [Usage] • Evaluate a building design or renovation project for circular economy compliance, scoring it against a material passport framework [Assessment]
Readings : [EllenMacArthur2019]	

8. WORKPLAN

8.1 Methodology

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9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

AR401. Capstone project I (Mandatory)

2. GENERAL INFORMATION

2.1 Course	: AR401. Capstone project I
2.2 Semester	: 8 th Semester.
2.3 Credits	: 4
2.4 Hours	: 4 HT; 4 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Mandatory
2.7 Learning modality	: Face to face
2.8 Prerequisites	: AR400. Methodology of Research. (5 th Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

Thesis I: Research and Program introduces students to the systematic process that precedes architectural design development: selecting and scoping a thesis topic, conducting a rigorous review of precedents, case studies and literature, building a theoretical and conceptual framework, and – where applicable to the chosen thesis approach – formulating research hypotheses and operationalizing their variables. The course closes by applying design research methods to translate these findings into an architectural program (design brief) that will directly drive the preliminary design developed in Thesis II (AR402).

5. GOALS

- Select and scope a thesis topic within the field of architecture, identifying its relevance and feasibility.
- Conduct a systematic review of precedents, case studies and scientific/technical literature relevant to the chosen topic.
- Build a theoretical and conceptual framework that positions the thesis's contribution and identifies a knowledge gap.
- Formulate research hypotheses and operationalize their variables, where applicable to the thesis's research approach.
- Apply design research methods (research through design, case study, evidence-based design) to translate research findings into an architectural program (brief) that will guide the preliminary design developed in Thesis II.

6. COMPETENCES

AG-A01) Evaluates the impact of architectural solutions on sustainable development, economy, health and safety, the legal framework, architectural-urban heritage, and the environment. (Assessment)

AG-A04) Communicates effectively and inclusively with the architecture community and society through reports, design documentation, and presentations tailored to different audiences. (Assessment)

AG-A09) Creates architectural designs that satisfy aesthetic and technical requirements. (Assessment)

AG-A10) Conducts studies of complex problems using research methods, experimental design, data analysis, and information synthesis to reach valid conclusions. (Assessment)

7. TOPICS

Unit 1: Research Design and Methodologies (10 hours)	
Competences Expected: AG-A01,AG-A04,AG-A09,AG-A10	
Topics	Learning Outcomes
- Formulating research questions in architecture: descriptive, relational, causal; turning design problems into researchable questions - Choosing a research methodology: quantitative (hypothesis testing, statistical), qualitative (interpretive, case study), mixed methods, - Validity and reliability in architectural research: internal validity, external validity (generalizability), construct validity, - Research ethics in architectural research: informed consent, privacy (anonymization of building users), institutional review board (IRB) protocols, - Mixed methods research: sequential (qualitative then quantitative) and concurrent designs; integrating qualitative findings (user interviews) with quantitative data (occupancy	- Describe the main research methodologies in architecture - quantitative, qualitative, mixed methods, practice-based - and explain their appropriate applications [Familiarity] - Develop a research design for an architectural inquiry, including research question, literature review, methodology selection, data collection protocol, and analysis plan [Usage] - Evaluate the research design of a published architectural study for validity, reliability, and ethical soundness, identifying methodological strengths and weaknesses [Assessment]
Readings : [GroatWang2013], [Creswell2018], [Zeisel2006]	

Unit 2: Theoretical Framework and Literature Review (10 hours)	
Competences Expected: AG-A01,AG-A04,AG-A09,AG-A10	
Topics	Learning Outcomes
- Systematic search of scientific and technical literature: specialized databases (Scopus, Web of Science, ASCE Library), keywords, and Boolean operators - Critical reading and synthesis of scientific articles, technical standards, and prior research reports - Building the conceptual and theoretical framework: defining key concepts, relationships between variables, and reference theoretical models - Identifying knowledge gaps (research gap) and justifying the originality of the proposed contribution - Bibliographic reference management and citation styles (APA, IEEE) using tools such as Zotero or Mendeley	- Explain the structure and purpose of a theoretical framework within a civil engineering research project [Familiarity] - Conduct a systematic search of scientific and technical literature on a chosen research topic using specialized databases [Usage] - Synthesize the state of the art of a research topic into a coherent theoretical framework that identifies a knowledge gap [Assessment]
Readings : [GroatWang2013], [Creswell2018], [Zeisel2006]	

Unit 3: Research Hypotheses and Variables (8 hours)	
Competences Expected: AG-A01,AG-A04,AG-A09,AG-A10	
Topics	Learning Outcomes
• Types of hypotheses: null, alternative, directional, and non-directional, and their relationship to research questions • Classification of variables: independent, dependent, control, and confounding • Operationalizing variables: defining measurable indicators and measurement scales (nominal, ordinal, interval, ratio) • Relationship between hypotheses, variables, and statistical significance tests: significance level, Type I and Type II error • Graphical representation of the relationship between variables through conceptual or operational models	• Distinguish between null and alternative hypotheses, and between independent, dependent, and control variables, in a civil engineering research problem [Familiarity] • Formulate a testable research hypothesis and operationalize its variables for a specific problem in the chosen specialization area [Usage] • Evaluate the consistency between the theoretical framework, the stated hypothesis, and the proposed data-collection design [Assessment]
Readings : [GroatWang2013], [Creswell2018], [Zeisel2006]	

Unit 4: Design Research Methods (10 hours)	
Competences Expected: AG-A01,AG-A04,AG-A09,AG-A10	
Topics	Learning Outcomes
• Research through design: using the design project itself as a research instrument; documenting, reflecting on, and theorizing the design process as a form of knowledge production • Architectural case study methodology: selecting, documenting, and analyzing built projects as evidence; comparative case studies across typology, culture, or climate • Evidence-based design: drawing on post-occupancy evaluation data, environmental psychology research, and user behavior studies to inform spatial and material design decisions • Literature review and theoretical framing in architectural research: identifying relevant scholarship, positioning a design project within architectural discourse, • Architectural criticism and evaluation frameworks: applying formal, phenomenological, typological, and sociocultural lenses to critically assess architectural works and proposals • Dissemination of design research: writing architectural essays, preparing conference papers and journal submissions, and presenting design-research projects to academic	• Describe the main modes of architectural design research - research through design, case study, and evidence-based design - and explain how each produces architectural knowledge [Familiarity] • Apply a design research methodology to frame, conduct, and document an investigation into an architectural design problem, producing a structured argument supported by evidence [Usage] • Critically evaluate an architectural design research project for the rigor of its methodology, the quality of its evidence, [Assessment]
Readings : [GroatWang2013], [Creswell2018], [Zeisel2006]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

AR3D3. Design Studio IX (Mandatory)

2. GENERAL INFORMATION

2.1 Course	: AR3D3. Design Studio IX
2.2 Semester	: 9 th Semester.
2.3 Credits	: 4
2.4 Hours	: 4 HT; 4 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Mandatory
2.7 Learning modality	: Face to face
2.8 Prerequisites	: AR3D2. Design Studio VIII. (8 th Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

Design Studio IX: Metropolitan Infrastructure and Civic Facility raises the sequence's scale and program complexity once more after Design Studio VIII (AR3D2, prerequisite), to the metropolitan scale: students design a high-complexity civic facility – a transit terminal, a stadium, a convention center – whose scale requires long-span structural systems and an explicit integration with the city's urban structure, alongside the development feasibility analysis appropriate to a project of this magnitude. This course is the foundation for the sequence's final, most comprehensive studio, Design Studio X (AR3D4).

5. GOALS

- Design the programming and spatial organization of a high-complexity civic facility at metropolitan scale.
- Design long-span structural systems (trusses, space frames, shells, or tensile structures) appropriate to a large-scale civic facility.
- Integrate the civic facility's design with the city's structure across scales – from the regional network down to its immediate urban context.
- Coordinate the structural, envelope, and building-system assemblies required by a large-scale, high-complexity building.
- Evaluate the development feasibility of a metropolitan-scale civic facility, including market, regulatory, and financial constraints.

6. COMPETENCES

AG-A08) Understands the structural and environmental design problems associated with construction and the engineering of building design. (Usage)

AG-A09) Creates architectural designs that satisfy aesthetic and technical requirements. (Usage)

AG-A12) Possesses the design skills needed to satisfy building users' requirements within cost constraints and building regulations. (Usage)

7. TOPICS

Unit 1: Large-Scale and Complex Buildings (14 hours)	
Competences Expected: AG-A09	
Topics	Learning Outcomes
• Programming and spatial organization at large scale: stacking diagrams, core-to-perimeter ratios, vertical circulation strategies, • Life safety and means of egress in large buildings: occupancy-based egress design, pressurized stairwells, refuge floors, fire compartmentalization, and NFPA/IBC requirements • Vertical transportation systems: elevator group design, sky lobbies, express/local zone strategies, escalators, and integration of vertical transport into building form • Hybrid and mixed-use building design: separating and linking residential, commercial, hotel, and civic programs; transfer floors, podium strategies, and shared amenity programming • Phased construction and building complexity: designing for construction staging, operational continuity, future expansion, and changeable use within long-lifespan complex buildings • Campus and master plan design at large scale: site organization, wayfinding, public realm, phasing, infrastructure coordination, and identity across a multi-building ensemble	• Identify the key design challenges - program complexity, life safety, vertical transport, and phasing - that distinguish large-scale buildings from smaller architectural projects [Familiarity] • Apply large-scale building design strategies to develop a spatial and programmatic organization for a complex multi-story or mixed-use building typology [Usage] • Evaluate a large-scale building design for programmatic coherence, life safety compliance, and operational efficiency [Assessment]
Readings : [Schierle2012]	

Unit 2: Urban Design at Multiple Scales (10 hours)	
Competences Expected: AG-A09	
Topics	Learning Outcomes
- Regional and city scale: transit corridors, green belts, growth boundaries, satellite towns, and the relationship between density - Neighborhood scale: walkability (5-10 minute walking radius), mixed-use zoning, social infrastructure (schools, clinics, community centers), and the 20-minute neighborhood concept - Block and street scale: block length for pedestrian permeability (80-120 m max), street section design (lane widths, sidewalks, bike lanes, street trees, furniture zone), - Public space design: squares, plazas, parks, pocket parks, and streets as public space; William Whyte's elements of successful public space (sittable space, sun, food) - Urban design guidelines: building setbacks, height limits, architectural character, facade articulation, signage, lighting,	- Describe the key design considerations at each urban scale - regional, neighborhood, block, street, and public space - [Familiarity] - Develop a set of urban design guidelines for a specific neighborhood or street typology, integrating density, building height, block length, street section, [Usage] - Evaluate an urban design project for its multi-scale coherence, assessing how well it integrates regional transit, neighborhood walkability, block permeability, street safety, [Assessment]
Readings : [Lynch1960]	

Unit 3: Long-Span and Special Structures (12 hours)	
Competences Expected: AG-A08	
Topics	Learning Outcomes
- Arches and vaults: funicular compression geometry, buttressing requirements, ribbed vs. continuous vaults, and historic and contemporary applications (Guastavino, Candela) - Domes and shells: membrane theory, edge ring forces, buckling in thin shells, geodesic domes (Fuller), and reinforced concrete shells (Nervi, Isler) - Space frames and long-span trusses: three-dimensional truss action, node design, modular systems (Mero, Unistrut), and application in arenas, airports, and exhibition halls - Tensile and cable structures: cable nets (Frei Otto), fabric membranes (PTFE-coated fiberglass, ETFE), masts and anchorage design, and form-finding via physical - Folded plate structures: corrugated geometry for stiffness, folded plate concrete roofs, and timber folded plate systems (CLT folded plates) - Deployable and transformable structures: scissor linkages, pantographic systems, and their application in retractable roofs, emergency shelters, and kinetic architecture	- Describe the principal long-span structural systems - arches, domes, space frames, tensile membranes - and identify the appropriate span range [Familiarity] - Select and conceptualize a long-span structural system for a given program (e.g., stadium, airport terminal, convention center), justifying the choice by span, load, [Usage] - Evaluate the structural efficiency and architectural expression of a built long-span structure, analyzing its load path, stability, and integration of form with structural logic [Assessment]
Readings : [Schierle2012]	

Unit 4: Building Systems and Assemblies (10 hours)	
Competences Expected: AG-A08	
Topics	Learning Outcomes
- Integration of building systems: coordinating structural frame, mechanical/electrical/plumbing (MEP), envelope, and interior fit-out within constrained floor-to-floor heights - Construction documentation for assemblies: details at 1:5, 1:10, and 1:20; section-through-wall details, sill and head conditions, and coordination between architectural - Construction tolerances and coordination: dimensional tolerances in concrete, steel, and masonry; clearances for MEP rough-in - Waterproofing and moisture management: below-grade waterproofing systems, drainage planes, vapor barriers, and flashing at penetrations - Fire-rated assemblies: UL-listed wall, floor, and ceiling assemblies; fire-stopping at penetrations, intumescent seals, and the architectural detailing required by fire codes - Prefabricated and modular assemblies: volumetric modular construction, panelized wall systems, and the design implications of off-site manufacturing tolerances	- Identify the principal building systems and describe how they are integrated and coordinated within a multi-story building assembly [Familiarity] - Develop construction-level details for a building assembly that correctly coordinate structural, envelope, and MEP systems within realistic tolerances and code requirements [Usage] - Evaluate a set of construction documents for assembly coordination quality, identifying conflicts, missing details, and buildability risks [Assessment]
Readings : [AllenIano2019]	

Unit 5: Development Process and Feasibility (8 hours)	
Competences Expected: AG-A12	
Topics	Learning Outcomes
- Development phases: site identification, option agreement, due diligence, entitlement (zoning, permits), design - Due diligence for development sites: title review, environmental assessment (Phase I and II), geotechnical investigation, zoning analysis, utility availability, - Entitlements and permitting: land use approvals (re-zoning, variances, conditional use permits), building permits, impact fees (school, traffic, parks) - Feasibility study components: market support, site suitability, regulatory pathway, construction feasibility, financial pro forma (with sensitivity analysis), - Real estate pro forma basics: projected net operating income ($\text{NOI} = \text{gross potential rent} - \text{vacancy allowance} - \text{operating expenses}$), debt service coverage ratio (DSCR),	- Describe the major stages of the real estate development process - predevelopment, construction, lease-up, disposition - and the due diligence [Familiarity] - Prepare a feasibility study for a proposed development, including market analysis, site due diligence summary, entitlement pathway, construction cost estimate, [Usage] - Evaluate a development pro forma for financial viability, identifying understated risk (vacancy, construction contingency) [Assessment]
Readings : [MilesBerensWeiss2007]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

AR402. Capstone project II (Mandatory)

2. GENERAL INFORMATION

2.1 Course	: AR402. Capstone project II
2.2 Semester	: 9 th Semester.
2.3 Credits	: 4
2.4 Hours	: 4 HT; 4 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Mandatory
2.7 Learning modality	: Face to face
2.8 Prerequisites	: AR401. Capstone project I. (8 th Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

This course develops the architectural preliminary design (anteproyecto) of the student's own thesis project, building directly on the program and theoretical framework produced in Thesis I (AR401, prerequisite). Each student works under the individualized supervision of a thesis advisor whose expertise matches the chosen project typology, developing a design proposal that responds to the program, site context, and evidence-based design criteria through continuous and final evaluation.

5. GOALS

- That the student develops a design concept and schematic design response to the architectural program defined in Thesis I.
- That the student selects a thesis advisor whose expertise matches the chosen project's typology and technical scope.
- The deliverables of this course are:

Partial: Schematic design (site plan, floor plans, sections, massing studies) supported by an evidence-based design rationale.

Final: A complete anteproyecto (preliminary design) package – plans, sections, elevations, and three-dimensional representation – with a design narrative, ready for executive-level development in Thesis III.

6. COMPETENCES

AG-A04) Communicates effectively and inclusively with the architecture community and society through reports, design documentation, and presentations tailored to different audiences. (Assessment)

AG-A08) Understands the structural and environmental design problems associated with construction and the engineering of building design. (Assessment)

AG-A09) Creates architectural designs that satisfy aesthetic and technical requirements. (Assessment)

AG-A10) Conducts studies of complex problems using research methods, experimental design, data analysis, and information synthesis to reach valid conclusions. (Assessment)

7. TOPICS

Unit 1: Architectural Preliminary Design (Anteproyecto) (60 hours)	
Competences Expected: AG-A04,AG-A08,AG-A09,AG-A10	
Topics	Learning Outcomes
• Development of the architectural design concept and schematic design response to the thesis program (site plan, floor plans, sections, massing). • Evidence-informed design decision-making, including environmental, structural, and user-centered performance criteria, and – where the chosen typology is large-scale or complex – the specific design challenges of that building type.	• Develop a schematic design that responds to the architectural program and site context defined in Thesis I [Usar]. • Select a thesis advisor whose expertise matches the project's typology and technical scope [Usar]. • Apply evidence-based design criteria to justify key design decisions in the preliminary design [Usar]. • Produce a complete anteproyecto package (plans, sections, elevations, three-dimensional views) ready for executive-level development [Usar]. • Present the anteproyecto for formal advancement review [Usar].
Readings : [Ching2014], [Lawson2005], [Ulrich1991]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

AR3D4. Design Studio X (Mandatory)

2. GENERAL INFORMATION

2.1 Course	: AR3D4. Design Studio X
2.2 Semester	: 10 th Semester.
2.3 Credits	: 4
2.4 Hours	: 4 HT; 4 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Mandatory
2.7 Learning modality	: Face to face
2.8 Prerequisites	: AR3D3. Design Studio IX. (9 th Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

Design Studio X: Comprehensive Architectural Project closes the Design Studio sequence that began in Design Studio I (AR1D1) and continued through Design Studio IX (AR3D3, prerequisite). Students develop a high-complexity anteproyecto (preliminary design) that integrates, for the first time within a single project, every major dimension practiced across the sequence: a complex building program, a fully coordinated structural and systems assembly, net-zero-oriented sustainability strategies, and Building Information Modeling as the representational and coordination platform, all verified against applicable building codes. Unlike the Thesis sequence (AR401-AR403), this course does not involve thesis research or an individual defense: it is the Design Studio sequence's comprehensive, integrative capstone project.

5. GOALS

- Develop a comprehensive architectural anteproyecto that integrates complex programming, structural logic, and building systems into a single coherent design proposal.
- Coordinate the structural, envelope, and building-system assemblies of the comprehensive project into a constructible whole.
- Apply net-zero and high-performance sustainability strategies (energy modeling, efficiency-first design, on-site renewables) to the comprehensive project.
- Develop and coordinate the comprehensive project using Building Information Modeling, from conceptual massing to a construction-ready level of development.
- Verify the comprehensive project's compliance with applicable building codes and regulations.

6. COMPETENCES

AG-A09) Creates architectural designs that satisfy aesthetic and technical requirements. (Usage)

AG-A12) Possesses the design skills needed to satisfy building users' requirements within cost constraints and building regulations. (Usage)

AG-A13) Demonstrates knowledge of the means to achieve ecologically responsible design and environmental conservation and rehabilitation. (Usage)

7. TOPICS

Unit 1: Large-Scale and Complex Buildings (16 hours)	
Competences Expected: AG-A09	
Topics	Learning Outcomes
• Programming and spatial organization at large scale: stacking diagrams, core-to-perimeter ratios, vertical circulation strategies, • Life safety and means of egress in large buildings: occupancy-based egress design, pressurized stairwells, refuge floors, fire compartmentalization, and NFPA/IBC requirements • Vertical transportation systems: elevator group design, sky lobbies, express/local zone strategies, escalators, and integration of vertical transport into building form • Hybrid and mixed-use building design: separating and linking residential, commercial, hotel, and civic programs; transfer floors, podium strategies, and shared amenity programming • Phased construction and building complexity: designing for construction staging, operational continuity, future expansion, and changeable use within long-lifespan complex buildings • Campus and master plan design at large scale: site organization, wayfinding, public realm, phasing, infrastructure coordination, and identity across a multi-building ensemble	• Identify the key design challenges - program complexity, life safety, vertical transport, and phasing - that distinguish large-scale buildings from smaller architectural projects [Familiarity] • Apply large-scale building design strategies to develop a spatial and programmatic organization for a complex multi-story or mixed-use building typology [Usage] • Evaluate a large-scale building design for programmatic coherence, life safety compliance, and operational efficiency [Assessment]
Readings : [Schierle2012]	

Unit 2: Building Systems and Assemblies (12 hours)	
Competences Expected: AG-A09	
Topics	Learning Outcomes
- Integration of building systems: coordinating structural frame, mechanical/electrical/plumbing (MEP), envelope, and interior fit-out within constrained floor-to-floor heights - Construction documentation for assemblies: details at 1:5, 1:10, and 1:20; section-through-wall details, sill and head conditions, and coordination between architectural - Construction tolerances and coordination: dimensional tolerances in concrete, steel, and masonry; clearances for MEP rough-in - Waterproofing and moisture management: below-grade waterproofing systems, drainage planes, vapor barriers, and flashing at penetrations - Fire-rated assemblies: UL-listed wall, floor, and ceiling assemblies; fire-stopping at penetrations, intumescent seals, and the architectural detailing required by fire codes - Prefabricated and modular assemblies: volumetric modular construction, panelized wall systems, and the design implications of off-site manufacturing tolerances	- Identify the principal building systems and describe how they are integrated and coordinated within a multi-story building assembly [Familiarity] - Develop construction-level details for a building assembly that correctly coordinate structural, envelope, and MEP systems within realistic tolerances and code requirements [Usage] - Evaluate a set of construction documents for assembly coordination quality, identifying conflicts, missing details, and buildability risks [Assessment]
Readings : [AllenIano2019]	

Unit 3: BIM Fundamentals and Authoring (5 hours)	
Competences Expected: AG-A09	
Topics	Learning Outcomes
- Core BIM concepts: object-oriented modeling (walls, doors, windows with embedded data), parametric relationships (hosting, constraints), and the difference between BIM and conventional 2D/3D modeling - BIM authoring tools: Revit (project-based, family editor), ArchiCAD (virtual building model), Vectorworks, and their respective modeling philosophies and interoperability - Level of development (LOD) specification: LOD 100 (conceptual), 200 (schematic), 300 (detailed), 350 (construction-ready), 400 (fabrication), 500 (as-built) - Data exchange standards: Industry Foundation Classes (IFC) as openBIM exchange format, IFC schema (IfcWall, IfcDoor, IfcWindow, IfcSpace), and vendor-neutral model interoperability	- Describe the core concepts of BIM: object-based modeling, parametric relationships, LOD, and data exchange via IFC, and explain how BIM differs from traditional 2D CAD [Familiarity] - Develop a BIM model of a small building at LOD 200-300, producing plans, sections, elevations, and a simple schedule directly from the model, and export the model to IFC format [Usage] - Evaluate a BIM model for appropriate LOD, correct parametric relationships, and clean IFC export, identifying modeling errors that would impede downstream coordination or data exchange [Assessment]
Readings : [Eastman2011]	

Unit 4: BIM Execution Planning and Standards (3 hours)	
Competences Expected: AG-A09	
Topics	Learning Outcomes
• BIM Execution Plan (BEP): project goals for BIM use (clash detection, 4D/5D, facility management), LOD matrix by discipline, model sharing protocols • ISO 19650 framework: information management using BIM across the delivery and operational phases of assets, information requirements (EIR, OIR, AIR), and the information-delivery cycle	• Describe the purpose of a BIM Execution Plan and the ISO 19650 information-management framework, and explain how they structure a project's BIM deliverables [Familiarity] • Draft a BIM Execution Plan for a project, specifying BIM goals, LOD matrix, and information-delivery milestones aligned with ISO 19650 [Usage] • Evaluate a BIM Execution Plan for a design project, assessing its LOD specifications, exchange protocols, and BIM use cases for adequacy and clarity [Assessment]
Readings : [Eastman2011]	

Unit 5: Energy Efficiency and Net-Zero Design (10 hours)	
Competences Expected: AG-A13	
Topics	Learning Outcomes
• Building energy modeling (BEM): physics-based simulation (EnergyPlus, eQUEST, IES VE), input parameters (envelope, lighting, HVAC, schedules, plug loads), • Efficiency-first approach: envelope optimization (high R-value, low air leakage), high-performance glazing, efficient lighting (LED with controls), • On-site renewable energy: photovoltaic (PV) array sizing (roof, facade, parking canopy), inverter selection, and estimating annual production (PVWatts, SAM) • Zero energy certification frameworks: NZEB (zero net energy building) definitions by DOE, Living Building Challenge Energy Petal, and Passive House Plus • Deep energy retrofit for existing buildings: envelope upgrades (window replacement, exterior insulation), HVAC replacement with heat pumps, and lighting retrofit	• Describe the components of a net-zero energy building design - load reduction, efficiency, and on-site renewables - [Familiarity] • Perform a preliminary energy balance for a building design, calculating estimated EUI from a simple model and sizing a PV array to offset annual energy consumption [Usage] • Evaluate a proposed net-zero building design by reviewing its energy model inputs and assumptions, identifying unrealistic plug load estimates or insufficient PV area, [Assessment]
Readings : [Kibert2016]	

Unit 6: Building Codes, Accessibility, and Zoning (8 hours)	
Competences Expected: AG-A12	
Topics	Learning Outcomes
• Building codes and standards: IBC (International Building Code), IRC (International Residential Code), IFC (International Fire Code) • Means-of-egress and fire-evacuation route design: maximum travel distance to an exit, number and width of exits required by occupant load, exit discharge and assembly points, and diagramming evacuation routes on a life-safety plan • Accessibility codes: ADA Standards for Accessible Design, ICC A117.1, and local accessible building codes • Energy codes: IECC (International Energy Conservation Code), ASHRAE 90.1; prescriptive vs. performance paths • Zoning and land use regulations: zoning districts (residential, commercial, industrial, mixed-use), floor area ratio (FAR), lot coverage, setbacks, height limits • Permitting process: building permit, variance, special exception; code interpretation appeals; the architect's role in preparing permit sets, responding to plan review comments	• Describe the key provisions of building codes that affect architectural design - occupancy classification, means of egress, fire-resistance, accessibility, and energy performance [Familiarity] • Apply IBC occupancy and construction type tables to determine allowable building area and height for a given use and sprinkler status, [Usage] • Evaluate a building design's code compliance for accessibility (ADA) and life safety (IBC), identifying violations and recommending code-conforming modifications [Assessment]
Readings : [ChingCodes2017]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

1. COURSE

AR403. Capstone project II (Mandatory)

2. GENERAL INFORMATION

2.1 Course	: AR403. Capstone project II
2.2 Semester	: 10 th Semester.
2.3 Credits	: 4
2.4 Hours	: 4 HT; 4 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Mandatory
2.7 Learning modality	: Face to face
2.8 Prerequisites	: AR402. Capstone project II. (9 th Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

This course develops the student's anteproyecto (AR402, prerequisite) into a complete executive-level architectural project: full technical construction documentation, coordination of building systems and assemblies, compliance with applicable building codes and regulations, and selection of an appropriate project delivery method and contract framework. The course culminates in the final defense (sustentación) of the thesis before a jury, under the continued individualized supervision of the thesis advisor.

5. GOALS

- That the student develops complete executive-level construction documentation for the thesis project, integrating structural, envelope, and building-system assemblies.
- That the student verifies the project's compliance with applicable building codes and regulations, and selects an appropriate project delivery method and contract framework.
- The deliverables of this course are:

Partial: Executive project advance – construction documents, building-system assemblies, and a code-compliance review.

Final: Complete executive project (construction documentation set) and final thesis defense (sustentación) before a jury.

6. COMPETENCES

AG-A02) Applies ethical principles and the standards of professional architectural practice, respecting the legal framework and human diversity. (Assessment)

AG-A04) Communicates effectively and inclusively with the architecture community and society through reports, design documentation, and presentations tailored to different audiences. (Assessment)

AG-A12) Possesses the design skills needed to satisfy building users' requirements within cost constraints and building regulations. (Assessment)

AG-A14) Possesses creative capacity in construction techniques, grounded in a comprehensive understanding of the disciplines and construction methods related to architecture. (Assessment)

7. TOPICS

Unit 1: Executive Project Development (30 hours)	
Competences Expected: AG-A02,AG-A04,AG-A12,AG-A14	
Topics	Learning Outcomes
• Development of executive-level construction documentation: building-system assemblies, structural/envelope coordination, and construction details. • Verification of code compliance (zoning, accessibility, life safety, energy) and selection of an appropriate project delivery method and contract framework.	• Produce executive-level construction documents that correctly coordinate structural, envelope, and building-system assemblies [Evaluar]. • Verify the project's compliance with applicable building codes and regulations [Evaluar]. • Select and justify an appropriate project delivery method and contract framework for the thesis project [Evaluar].
Readings : [AllenIano2019], [AIA2017]	

Unit 2: Final Defense (Sustentación) (30 hours)	
Competences Expected: AG-A02,AG-A04,AG-A12,AG-A14	
Topics	Learning Outcomes
• Preparation of the final thesis defense: presentation boards, portfolio, and oral defense strategy. • Response to jury questions and critique on design, technical, and methodological decisions.	• Produce a design presentation (boards, portfolio, oral presentation) that communicates the complete thesis project to a jury [Evaluar]. • Defend the thesis project's design, technical, and methodological decisions before a jury, responding to critique [Evaluar].
Readings : [Ching2020]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY