

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

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