

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, CO₂), 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

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