



# Architectural Engineering

## Research methods and tools

The scope of this Ph.D. course is to give information about methods and tools to perform research activities in the Architectural Engineering field. Architectural Engineering is the field of knowledge aimed at achieving high-performance built environments whose technological sub-systems are designed to be sustainable, resilient, economically viable, and to ensure the safety, health, comfort, and productivity of occupants. Architectural Engineering involves the study of issues concerning the performances and impacts of new and existing buildings (including the heritage), the definition of technological solutions, processes and development models for the safety and environmental sustainability of buildings.

The course comprises **three** modules: Research tools; Research methods; Collaborative Workshop

The first module will comprise lectures addressed to giving the ability to use open-source software to perform basilar research activities. This module comprises the following lessons: 1) bibliographic management tools (Zotero, Docear, Mendeley); 2) Scientific writing tools (Markdown and Latex editor); 3) Data analysis tools (R); 4) Tools for the management of historical research documentary sources (OPAC SBN, SIAS)

The second module will propose a set of lectures with the discussion of the main phases of performed research projects financed by different organizations, (fund searching activity phase, writing phase, execution phase, reporting phase). Different types of projects financed by different organizations will be discussed. Lectures will involve researchers coming from different Universities and Research centres.

The third module will propose a collaborative workshop addressed to simulate one or more phases discussed.

24 hours

Teacher: Prof. Marco D'Orazio, Ph.D.

Architectural Engineering Research Methods and tools website: [LEARN.UNIVPM.IT](http://LEARN.UNIVPM.IT)



UNIVERSITÀ  
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DELLE MARCHE

Doctoral School in Sciences of Engineering  
Academic Year 2024/2025 – Feb/Mar 2025

## Course Outline

### **Architectural Engineering research methods and tools**

Professor Marco D’Orazio (February / March 2025)

#### **Aims**

The scope of the course is to give information about methods and tools to perform research activities in the Architectural Engineering field. Architectural Engineering is the field of knowledge aimed at achieving high-performance built environments whose technological sub-systems are designed to be sustainable, resilient, and economically viable, and to ensure the safety, health, comfort, and productivity of occupants. Architectural Engineering involves the study of issues concerning the performances and impacts of new and existing buildings (including the heritage), the definition of technological solutions, processes and development models for the safety and environmental sustainability of buildings.

#### **Methodology**

The course comprises three modules:

- Research tools
- Research methods
- Collaborative Workshop

The first module will comprise lectures addressed to giving the ability to use open-source software to perform basilar research activities. This module comprises the following lessons: 1) bibliographic management tools (Zotero, Docear, Mendeley); 2) Scientific writing tools (Markdown and Latex editor); 3) Data analysis tools (R); 4) Tools for the management of historical research documentary sources (OPAC SBN, SIAS)

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#### **Output**

- To acquire knowledge about open-source bibliographic management tools
- To acquire knowledge about open-source scientific writing tools

- To acquire knowledge about open-source data analysis tools
- To acquire knowledge about the tools and the criteria of critical dissertation.
- To develop autonomy and specific skills on the topic through the collaborative activity

### **Assessment criteria**

The course requires the attendance to at least 75% of the proposed activities, as lectures and seminars. The enrolled participants will need to register through a QR code that will be opened at the beginning and the end of each lecture. Preparation and participation are also strongly suggested to enhance the learning experience. The participants are required to read the proposed papers and charters for the discussions and to expose a case study for a final seminar.

### **Credits**

The course will give 3 credits to the PhD candidates who fulfil the above criteria. The course can enrol PhD candidates and non-Ph.D. candidates to act as listeners. They are not required to fulfil the assessment criteria and will not receive any credit.

### **Literature**

Readings and literature will be provided at each lecture, the participants will receive the .pdf copy of the lectures.

<https://sso.univpm.it/idp/profile/SAML2/Redirect/SSO?execution=e1s2>

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