

# **Conservation and Rehabilitation I:**

**Calendar:** 1st Year 1st Semester

**Contact Hours:** 37h30 T/P+ 7H30P/L + 7h30 EL/OT

## **Syllabus:**

Introduction to general concepts (old building, conservation, rehabilitation, heritage). Phases of a rehabilitation project. International Charters and Resolutions. Old buildings: construction processes and materials. Development of construction processes. Classification of buildings according to the time of construction. Characterization of constructive elements of old buildings. Walls and their coatings. Floors and coverings. Foundations. Major anomalies in old buildings. Structural and non-structural pathologies. Safety in use. Materials' degradation. Humidity and cracking. Wood pathologies. Major anomalies in wooden elements of old buildings. Diagnosis of pathology. Inspection's methodologies. Destructive and non-destructive techniques. Test procedures in situ and in laboratory. Structural safety. Improvement of living conditions and safety. Rehabilitation's methods. Thermal behavior. Humidity protection. Fire safety. Analysis of case studies. Survey, inspection and tests. Establishment of the diagnosis of the causes. Presentation of rehabilitation solutions.

## **Intended learning outcomes of the curricular unit:**

Students should acquire basic knowledge in the domain of the conservation and rehabilitation of old buildings (i.e. before the advent of reinforced concrete), in order to enable them to: identify and describe the materials and the construction processes of old constructions, identify the damages and enumerate the probable causes of degradation, describe the different deterioration mechanisms, define the methodology of tests and inspections and analysis of an old structure, define the objectives of a rehabilitation intervention, select the appropriate rehabilitation techniques and specify the properties of the products and systems to be applied, regarding the requirements of the habitation rehabilitation, the principles for the analysis, conservation and structural restoration of old buildings and architectural heritage and the International Charters and Resolutions.

## **Demonstration of the syllabus coherence with the curricular unit's intended learning outcomes:**

The knowledge of the built heritage, the mechanisms of degradation of buildings, materials and intervention technologies are fundamental to the practice of engineering acts related to the maintenance and rehabilitation of buildings. The syllabus of the course allow you to develop the skills of students in the areas considered essential under the maintenance and rehabilitation of buildings, including giving them the knowledge and skills required to describe and characterize the materials and construction processes, define the objectives and methodologies of assistance, select appropriate rehabilitation and maintenance techniques.