Building Rehabilitation

Course contents:

MAIN OBJECTIVE
The identification of intervention solutions in correlation with the degradation causes and with the technical assessment of buildings.

- General aspects
- Structural assessment of buildings
- Systems and equipment used in structure diagnosis
- Advanced polymeric composites for rehabilitation of buildings
- Infrastructure consolidation
- Brick and stone masonry structure consolidation
- Rehabilitation of reinforced concrete structures
- New systems for structural rehabilitation to earthquakes
- Reinforced concrete rehabilitation with advanced polymeric composites
- Rehabilitation of timber and steel structures
- Hygro-thermal rehabilitation of buildings

Elements of Non-Linear Computation in Civil Engineering

Course contents:

- **Introductive notions:** The structure model and the main principles. Classification of analysis types: - first order analysis (linear elastic, non-linear-elastic, inelastic); - second order analysis (linear elastic and geometrical non-linear, elastic and geometrical non-linear, inelastic and geometrical non-linear)

- **Second order geometrical non-linear analysis:** Hypotheses. Characteristic elements of the second order analysis. Effects superposition in the second order analysis. The displacement method in the second order analysis

- **Non-linear elastic analysis:** Basic notions. First order, non-linear elastic analysis. Second order, non-linear elastic analysis

- **Non-linear inelastic analysis:** Basic notions. First order inelastic analysis. The simple plastic method. The direct assessment of the ultimate load. The method of mechanisms combination. Considerations about the structure behaviour in the inelastic range

- **Second order inelastic analysis:** Basic notions. Hypotheses. Second order practical design. Stability loss by continuous deformation. Stability loss by continuous bifurcation. The compared analysis of the obtained results by using different studied methods for the non-linear design