



Course unit English denomination	Innovative Techniques for the Expansion of Existing Buildings
Teacher in charge	Umberto Turrini
Teaching Hours	24
Number of ECTS credits allocated	4
Course period	November – December
Course delivery method	<input checked="" type="checkbox"/> In presence <input type="checkbox"/> Remotely <input type="checkbox"/> Blended
Language of instruction	English
Mandatory attendance	<input checked="" type="checkbox"/> Yes (90 % minimum of presence) <input type="checkbox"/> No
Course unit contents	<p>The need to reduce the environmental impact in terms of CO2 emissions and to reduce soil consumption have made the topic of the refurbishment of the 20th century building heritage of absolute centrality. Currently, the topic of refurbishment is the field with the greatest potential for the entire world of construction. In fact, if for a long-time demolition was considered as the only possible solution - because it was considered cheaper - the vastness of the problem and the heterogeneity of the buildings required a deeper analysis and a new range of available interventions: from the re-functionalization of the building to the conservative refurbishment, from its energy requalification to structural improvement. Among the multidisciplinary techniques and materials for the high-tech design that will be addressed, are lateral addition and upwards elements. The addition of volumes or of a floor to the existing building allows, on the one hand, to respond to a need for housing without further consumption of land, while, on the other hand, the increase in volume can become the driving force for economic redevelopment for a sustainable recovery of the entire building, from an architectural, energy, urban and social point of view, as it would allow:</p> <ul style="list-style-type: none">• to be able to use accommodation during the construction site, without forcing the inhabitants to move;• to be able to use a high-tech upwards volume to provide energy to the entire residential building;• to be able to have an increase in the building stock without land consumption.
Learning goals	<p>The learning goals provide for the acquisition of skills to address the issue of volumetric increase of buildings in enlargement or elevation to be realized with lightweight elements in order to ensure architectural, energy, acoustic and structural performance as well as, through proper modularity, to reduce the execution time, with potential significant economic benefits.</p>
Teaching methods	Lectures with slides
Course on transversal, interdisciplinary,	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No



transdisciplinary
skills

Available for PhD
students from other
courses

Yes
 No

Prerequisites
(not mandatory)

Although not mandatory, it is highly recommended to have knowledge of the building organism in all its parts and the most widely used recovery methodologies. Other knowledge required are in areas of: Construction Science and Technology; Technical Architecture and Building Production; History of Architecture.

Examination
methods

Production of a final document in text or graphics mode (drawing in autocad or revit).

Suggested readings

Musso, S., (2016). Recupero e restauro degli edifici storici. Guida pratica al rilievo e alla diagnostica: EPC.
Malighetti S. (2004). Recupero edilizio e sostenibilità. Il contributo delle tecnologie bioclimatiche alla riqualificazione funzionale degli edifici residenziali collettivi. Il Sole 24 Ore.
Grecchi, M., & Malighetti, L. E. 1. (2008). Ripensare il costruito. Santarcangelo di Romagna:Maggioli.
Sassi, P. (2008). Strategie per l'architettura sostenibile. Milano: Ambiente.
Imperadori, M. (2001). Costruire sul costruito. Roma: Carocci.

Additional
information
