

Master Thesis Brief Description

Thesis Title	Evaluation of Technical and Economic Feasibility of interventions in heritage buildings
Programme of Studies	MSc in Sustainable Energy Systems
Course	MES 580 MSc Thesis
Area of Study	Computational Building Physics – Buildings Assessment
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Supervisory Committee	Dr Byron Ioannou, Assoc. Professor, Architectural Department Dr. George Karagiorgis, Assoc. Professor, Mechanical Engineering Department
Semester	Fall Semester 2022
Short Description	<p>This thesis focused on studying and analyzing the thermal behavior of external building structures, specifically external walls and ceilings, in Heritage buildings located in Cyprus. The investigation selected technical aspects and thermophysical properties of different types of Heritage building structures, with a primary focus on the most commonly found types. For each structure type, three different construction variations were examined. The main goal of this research was to present insulating solutions that could improve the thermal behavior of each investigated building structure. The aim was to harmonize the thermal transmittance factor with the values specified in local legislation. It's important to note that the thesis did not attempt to analyze the impact of every available insulating material when applied to the investigated structure, as such an investigation would be extensive and less significant. Instead, the central focus was to develop a Microsoft Excel-based platform that allows users to calculate the required thickness of insulating material needed to meet local legislative thermal transmittance requirements. Moreover, the research attempted to evaluate the economic feasibility of implementing such interventions in the buildings' core structures. This evaluation was based on factors like Net Present Value and Internal Rate of Return. An additional Excel sheet closely related to the one for calculating insulating material thickness was developed to facilitate this economic evaluation. These Excel sheets provided users with a comprehensive perspective, combining technical and economic aspects, of the interventions aiming to enhance the thermal behavior of the investigated Heritage building structures.</p>