Thesis Title	**Numerical Application for the Calculation of Thermal Transmittance of Building Elements**
Programme of Studies	MSc in Sustainable Energy Systems
Course	SES 701 Maser Thesis I + II
Area of Study	Computational Building Physics – Whole Building Energy Analysis
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Short Description	In this master thesis, six building elements, three external walls, two roofs and a column consisting of a number of layers of different materials were studied. All the building elements were studied as plane surfaces consisting of thermally homogeneous materials and heat transfer was always steady and one-dimensional, perpendicular to the elements. The purpose of this master thesis was to develop a numerical application for the calculation of thermal transmittance of building elements and to study the effect of thermal insulation on the heat transfer rate through those elements. Heat transfer is not only affected by insulation but also depends on the selection of the materials and their thickness due to the different value of their thermal conductivity. Firstly their overall heat transfer coefficient was calculated with a code written in Matlab without any insulation. Then, their thermal transmittance was calculated with the same code after including insulation and while gradually increasing its thickness. The dependence of the thermal transmittance of the building elements on the insulation thickness was presented graphically and showed that the overall heat transfer coefficient dropped asymptotically with the increase of the thickness of insulation. At last, an effort was done to estimate the optimum insulation thickness for each building element even though for a plane surface the overall heat transfer coefficient continues to decrease with the increase of the thickness of insulation.