Thesis Title	**Development of Predictive Models for Energy Consumption in Buildings using Machine Learning Techniques: A Pilot Study with Python Programming**
Programme of Studies	MSc in Energy Engineering
Course	MEE 540 MSc Thesis
Area of Study	Computational Building Physics – Building Information Modelling
Student's Name	Maria Andreou
Students Reg. Number	22970
Supervisor	Dr.-Ing. Paris A. Fokaides, Assoc. Professor, Mechanical Engineering Department
Supervisory Committee	Dr Byron Ioannou, Ass. Professor, Architectural Department Dr. George Karagiorgis, Assoc. Professor, Mechanical Engineering Department
Semester	Fall Semester 2023
Short Description	Energy consumption in buildings is a significant concern as it contributes to a significant proportion of global energy consumption. Predictive models can help to optimize energy usage and reduce energy waste, resulting in cost savings and a reduction in carbon emissions. Machine learning techniques can be used to develop accurate predictive models, which can help to optimize energy usage. The objective of this Master's thesis is to develop predictive models using machine learning techniques for predicting energy consumption in buildings. Specifically, the study aims to monitor a pilot building's energy consumption and use the data collected to develop predictive models using the Python language. The pilot building will be monitored for a period of time to collect data on energy consumption. The data collected will be used to develop predictive models using machine learning techniques, specifically using Python programming. Different machine learning algorithms such as linear regression, decision trees, random forests, and neural networks will be evaluated and compared to determine the most effective method for predicting energy consumption in buildings. The performance of the models will be evaluated based on their accuracy, precision, and recall. The results of this study will demonstrate the effectiveness of machine learning techniques for predicting energy consumption in buildings. The best performing algorithm will be identified, and recommendations will be made on the implementation of predictive models in real-world scenarios to optimize energy usage.