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MECHANICAL ENGINEERING COURSE

DIPLOMA PROJECT

DESIGN OF AN AIR CONDITIONING  
SYSTEM FOR A BUILDING

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**DESIGN OF AN AIR CONDITIONING**

**SYSTEM FOR A BUILDING**

**BY**

**YIALLOUROS CHRISTIS**

**PROJECT REPORT**

**SUBMITTED TO**

**THE DEPARTMENT OF MECHANICAL ENGINEERING**

**OF THE HIGHER TECHNICAL INSTITUTE**

**NICOSIA CYPRUS**

**IN PARTIAL FULFILLMENT OF THE REQUIREMENTS**

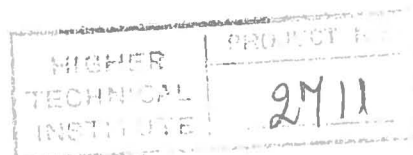
**FOR THE DIPLOMA OF**

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## SUMMARY

The purpose of this project is to design an air-conditioning system for a building.

The method of thermal load calculation was based on a computer program provided by "CARRIER".

Architectural drawings for the building were provided. Design conditions were supplied, while ambient conditions were based on data collected from the meteorological service.

Energy conservation and noise control were considered to be of major importance in the design of the system.

The project is divided into three parts.

The first part deals with the calculation of the thermal load of the building for heating and cooling. The procedure was based on a computer program provided by "CARRIER", which was based on the actual theory of heating and cooling loads estimation.

The second part deals with the system selection, with the selection of appropriate machinery as well as with equipment, duct and pipe sizing.

Finally the third part provides estimated cost analysis for the system employed and a preventive maintenance scheme for the major equipment used.

The system layout and its major components including piping, ducting and controls are presented on a complete set of detailed mechanical drawings.

The project is divided into 8 Chapters.

## INTRODUCTION

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Full air conditioning implies the automatic control of an atmospheric environment either for the health and comfort of human beings or animals, or for the proper performance of some industrial or scientific process, irrespective of external climatic conditions.

The objective "Full" or "Complete" means that the temperature, relative humidity or moisture content, purity and movement of the air are controlled, within the limits imposed by the design specification.

The more civilized people become, the more sophisticated are the demands for a healthy and pleasant atmosphere. But nowadays the energy crisis requires the design engineer to consider the energy conservation as a vital factor.

One of the most effective ways of reducing overall energy consumption by using air conditioning systems, is to minimize the thermal transmittance coefficient of the enclosed structure (i.e. walls) by improved insulation and therefore the required capacity of the A/C system is reduced. Also the increased efficiency of systems and equipment as well as their carefully sizing and selection may contribute to less power consumption. The A/C system for Universal's offices in Nicosia requires a comfort and year-round type of air conditioning system. In the further stages the appropriate system is selected according to the thermal load demand of the building for heating and cooling.

The aim of the selected system is to satisfy the majority of the occupants providing a comfort environment by the help of automatic controls in each conditioned space. These shall occur trying to achieve the best performance and economics of the whole air conditioning system.