

**THERMAL COMFORT IN CLASSROOMS AT UITM JENGA PAHANG,  
MALAYSIA.**

**NUR FATIN BINTI HAMIR**

**Final Year Project Report Submitted in  
Partial Fulfilment of the Requirements For The  
Degree of Bachelor of Science (Hons.) Physics  
in The Faculty of Applied Science  
Universiti Teknologi MARA**

**JULY 2014**

## ACKNOWLEDGEMENT

First and foremost, I would like to express my thank to ALLAH SWT the Al-mighty for making this Final Years Project possible. I also like to indicate my utmost appreciation to Mr. Badrul Hisham Bin Mohd Noor as my project supervisor who had taken a lot of effort to meticulously go through with the work and has guided me in doing my project and at the same time give helpful advice to ensure my project can be done successful. To the all lecturer, all staff and any other individuals at Universiti Teknologi MARA PAHANG I would say thanks for their directly or indirect help in this Final Year Project. With of their support, I was able to complete this report.

Secondly, I would like to indicate my recognition to students of UiTM JENGKA PAHANG that act as respondents to my survey questionnaire. Their good cooperation makes me able to collect the data smoothly. To all my friends that contributed ideas and infomation in my project, I am very thankful and appreciate all the collaborations.

I would like to express heartfelt appreciation to my parents that always offer advice and inspiration in my life. Thank you.

*Nur Fatin Binti Hamir*

*Faculty of Applied Sciences*

*UiTM*

## TABLE OF CONTENTS

	<b>Page</b>
<b>ACKNOWLEDGEMENTS</b>	iii
<b>TABLE OF CONTENTS</b>	iv
<b>LIST OF TABLES</b>	vi
<b>LIST OF FIGURES</b>	vii
<b>LIST OF ABBREVIATIONS</b>	viii
<b>LIST OF GRAPH</b>	ix
<b>ABSTRACT</b>	x
<b>ABSTRAK</b>	xi
<b>CHAPTER 1 INTRODUCTION</b>	
1.1 Background of Study	1
1.2 Problem Statement	4
1.3 Research Objectives	4
1.4 Significance of Study	5
1.5 Scope of Work	5
<b>CHAPTER 2 LITERATURE REVIEW</b>	
2.1 Introduction	6
2.2 Malaysia background studies	6
2.3 Thermal comfort	7
2.4 Factor of thermal comfort	10
2.5 Cooling Methods Implemented In Malaysia	19
2.6 Thermal Comfort in Warm and Humid Tropical Countries	20
<b>CHAPTER 3 METHODOLOGY</b>	
3.1 Introduction	25
3.2 Participants	25
3.2.1 Experimental environment and apparatus	25

3.3	Procedures	26
	3.3.1 Methodology	26
3.4	Data collection	27
	3.4.2 Questionnaires	27

#### **CHAPTER 4 RESULT AND DISCUSSION**

4.0	Introduction	28
4.1	Description of the data	28
4.2	Finding and analysis from survey	28
4.3	Conclusion	34

#### **CHAPTER 5 CONCLUSION AND RECOMMENDATIONS**

5.0	Introduction	35
5.1	Conclusion	35
5.2	Recommendation based on the findings	36

<b>CITED REFERENCES</b>	37
-------------------------	----

<b>APPENDICES</b>	39
-------------------	----

<b>CURRICULUM VITAE</b>	40
-------------------------	----

## **ABSTRACT**

### **THERMAL COMFORT IN CLASSROOMS AT UITM JENGKA PAHANG, MALAYSIA**

Thermal comfort is defined as “ that condition of mind, which expresses satisfaction with the thermal environment” (ISO Standard 7730 in 1994). This thesis presents an investigation into the parameters that affected thermal comfort level for in classrooms at Infra Sainstek UiTM JENGKA, PAHANG. This study only examines the effect of major variables influencing thermal performance on human being (students) such as air temperature, humidity, clothing, health condition and metabolic rate. The location of Malaysia, especially Jengka, Pahang, close to the equator, with the tropical region, it has a warm and humid climate, with high air temperature and high humidity level throughout the year.

The research was done using the Extech EA80 and recorded in the table following the parameters. Classrooms are chosen randomly. Students were randomly selected to answer the questionnaires. The number of students in classrooms range from 15 people to 30 people. Only 5 students will be selected to answer the questionnaires for every class involved. Students answer the questionnaires just before the end of the class period to ensure no effect due to acclimatization and more uniform metabolic rate. The result show that the questionnaire have been able to identify the parameter that affect the thermal comfort level in classrooms at Infra Sainstek , UiTM JENGKA PAHANG . Also know the optimum range of temperature setting for air conditioners in classrooms at Infra Sainstek, UiTM JENGKA PAHANG.

The study showed that the optimum temperature setting for air conditioners should be at 24°C. The study also proved that parameters such as air temperature, humidity, clothing and air quality do affect thermal comfort of occupants of a room.