

# **THERMAL COMFORT AND DISCOMFORT IN THE KINGDOM OF SAUDI ARABIA, AN APPLICATION OF THOM'S THEORY, A STUDY IN APPLIED CLIMATOLOGY**

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*Heat is now considered one of the most influential elements on human life , health and activities .*

*As heat plays a major role in the comfort of human beings , heat has a direct and prominent impact on all kinds of climate.*

*Moderate heat can be a cause of comfort and it can also help humans to reach the optimal level of activity .*

*On the other hand extremes of weather can have a negative effect on humans , for an example , extreme heat can lead to heat exhaustion especially with high humidity levels (to a degree that could interfere with sweat evaporation) , while extremely cold weather can cause rapid body cooling and temperature imbalance , Also, exposure to extreme coldness for long periods of time can result in increase of the severity of certain diseases such as arthritis and sinusitis .*

*Relative humidity goes side by side with heat in the determination of the degree of significant comfort when it comes to different weather variations , It is well known that a normal human body can withstand a relatively hot weather with low humidity , while higher humidity levels can accelerate the occurrence of heat exhaustion and even heat strokes due to the interference with sweat evaporation which can lead to the failure of the natural cooling process in the human body.*

*Some researchers have suggested specific measures for the thermal levels of comfortor discomfort , and these measures can vary greatly depending on many causes such as personal preferences , nature of work and the region , it also varies from one season to another .*

## ***This study aims to:***

*- The determination of the different thermal comfort and discomfort zones in the Kingdom of Saudi Arabia .*

*- Drawing a monthly , seasonal and annual maps for thermal comfort and discomfort zones in the Kingdom of Saudi Arabia .*

*- Making spatial and temporal schedules that could determine the thermal comfort and discomfort zones in the Kingdom of Saudi Arabia .*

## ***Keeping in mind the following:***

*- Both heat and humidity have an impact on the determination of thermal comfort and discomfort in the Kingdom of Saudi Arabia .*

*- Extremes of heat and humidity can have a negative effect on the level of thermal comfort and increases the level of thermal discomfort in the Kingdom of Saudi Arabia.*

*- Moderate levels of heat and humidity can lead to thermal comfort in the Kingdom of Saudi Arabia .*

*- The presence of different monthly and annual Thermal zones in the Kingdom of Saudi Arabia because of the vast geographical variations .*

*- The spatial and temporal differences between different thermal zones in the Kingdom of Saudi Arabia .*

*There are some curricular variations when it comes to climatological studies , for an example there is the fundamental approach , the analytical approach and the descriptive and inductive approaches .*

*Quantitative and statistical methods can be used to convert digital data into maps , this study depended mainly on the degrees of heat and relative humidity which are the major elements in the determination of thermal comfort and discomfort as follows:*

*-Data about heat and relative humidity levels was collected from 34 different meteorological station distributed equally in the study region and then Thom's theory was applied using Excel.*

*-Using other programs like autocad and mapinfo-surfer i was able to draw maps with meticulous data interpretation , analysis of the final data was done to determine the different thermal comfort and discomfort zones in the Kingdom Of Saudi Arabia .*