بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

MONA MAGHRABY

NUMERICAL INVESTIGATION OF FLOW PATTERNS AND THERMAL COMFORT INSIDE AIR-CONDITIONED CLASSROOM

By

Eng. Mahmoud Mohamed Ahmed Abdelmaksoud Abu-Saad

A Thesis Submitted to the Faculty of Engineering at Cairo University in Partial Fulfilment of the Requirements for the Degree of MASTER OF SCIENCE

In

MECHANICAL POWER ENGINEERING

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Under Supervision of

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FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Title of Thesis:

NUMERICAL INVESTIGATION OF FLOW PATTERNS AND THERMAL COMFORT INSIDE AIR-CONDITIONED CLASSROOM

Key Words:
Thermal comfort; flow pattern; air- conditioning

Summary:
In this thesis we will concern primarily with simulation of airflow pattern, carbon dioxide dispersion, and thermal comfort inside an educational classroom in Institute of Aviation Engineering and Technology, which is located on the second floor of the building of architecture, Hall 3201. An experimental investigation on the same classroom was accomplished which aims to validate the used CFD code and a Good the agreement is found among both predictions. These investigations included the measurements of relative humidity, and temperature, which were done using (Elcometer 319 Dewmeter gauge. The study is employed using CFD simulation techniques as embedded in the commercially available CFD code (FLUENT 19). The domain assembly case was finally discretized into 4,444,200 averaged tetrahedral elements. The thesis is keen to numerically investigate influence of changing the type of air outlet on the distribution of air and the thermal comfort for the occupants inside the teaching space and choosing the best design of air conditioning inside the classroom, this could be expressed concerning with only three different types of air outlet which are square diffuser, swirl diffuser, and round diffuser.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and cited them in the references section.

Name: Date:

Signature:

Acknowledgments

With the name of ALLAH, I started this research hoping that it accelerates the wheel of progress in this field.

I would like to express my sincere appreciation and infinite thanks to **Professor Dr. Essam E. Khalil**, professor of mechanical power- faculty of engineering–Cairo University, who gave me a great scientific support and guidance to make a progress in my research. Besides, having severe admiration of his gigantic experience and unlimited co-operation and efforts of helping me to introduce this research in the best.

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