جـــامعة الفـــيوم
Fayoum University

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Title of Thesis: Biomimicry for achieving sustainable architecture: Applying lessons of nature and building technology to inspired sustainable envelops

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Department: Architecture **Approval:----------**

ABSTRACT

The thesis discusses the concept of environmental sustainability in the field of architecture, and biomimicry approach as an entrance to achieve sustainability, which depends on the idea of achieving interaction and the balance between the built environment and the natural environment surrounding it in order to eliminate the negative effects of human activities on the earth through the presentation of biomimicry approach ″historical background, the most important terminology, principles, levels, theories, methodologies″.

This thesis is trying to verify the possibilities of the application of this new approach in the field of architecture to achieve innovative and sustainable solutions for each contemporary challenges facing the architect during the design process through the focus on the challenge of designing building's envelopes working like a natural filter for the environmental factors, rather than being a barrier to it. Where these envelopes adapt positively with the local climate of solar radiation, a relative humidity, rain, ...etc.

The research studies two main parts in order to achieve the objectives and to demonstrate the hypotheses previously mentioned.

- **First: theoretical study:**

The research includes the three sections:

→ Section I: Sustainability and biomimicry: it presents both causes of the confusion in the application of the concept of sustainability, and the most important terminology related to the methodology of the biomimicry.

→ Section II: Design inspired by nature: it presents both the background of the historic development of the simulation of nature in various areas & in architecture, current vision of biomimicry in various fields, the most important Pioneers of the new discipline.

→ Section III: Biomimicry as a methodology to sustainable design: it presents "levels, theories, principles, approaches and methodologies for biomimicry ".

- **Secondly: Analytical Study:**

This part studies both the impact of the using of biomimicry methodology in the architectural design for solving the problems facing the architect and how biomimicry volunteered modern technology to solve those problems through focusing on the problem of envelopes of buildings, this part consists of two main sections:

→ Section IV: Analytical Study: this section presents the methodology of the analytical study, analytical study, and the results of the analytical study.

→ Section V: results and recommendations: it presents both of the General results and recommendations of the research.