

EDITORIAL BOARD

Editor-in-Chief:

Prof. Dr. Bassam G. Rasheed

Laser and Optoelectronics Eng. Dep., Al-Nahrain Univ., Baghdad, Iraq.

Editorial Board:

Prof. Dr. Riadh Al-Mahaidi

Structural Engineering, Swinburne University of Technology, Australia.

Prof. Dr. Raghad Mofeed Mohamed Ibrahim

Faculty of Engineering, Cairo University, Cairo, Egypt.

Prof. Dr. Mohamad Khalil

Faculty of engineering, Lebanese University, Lebanon

Assist. Prof. Dr. Manal Jamil Al-Kindi

Electronic and Communications Eng. Dep., Al-Nahrain University, Baghdad, Iraq.

Assist. Prof. Dr. Ahmed Waheed Mustafa

Mechanical Eng. Dep., Al-Nahrain University, Baghdad, Iraq.

Assist. Prof. Dr. Alaa Hussein Abed

Civil Eng. Dep., Al-Nahrain University, Baghdad, Iraq.

Assist. Prof. Dr. Irfan S. Al-Anbagi

Faculty of Engineering and Applied Science, University of Regina, Canada

Assist. Prof. Dr. Hussein Znad

Chemical Engineering Department, Curtin University, Australia

Assist. Prof. Dr. Mohammed Qasim Abdul Ghafoor Al Ani

Architecture Eng. Dep., Al-Nahrain University, Baghdad, Iraq.

Assist. Prof. Dr. Saad H. Ammar

Chemical Eng. Dep., Al-Nahrain University, Baghdad, Iraq.

Assist. Prof. Dr. Auns Qusai Hashim Al-Neami

Biomedical Eng. Dep., Al-Nahrain University, Baghdad, Iraq.

Managing Editor

Dr. Ahmed Riedh A. Al-Hamaoy

Laser & Optoelectronics Eng. Dep., Al-Nahrain Univ., Baghdad, Iraq.

Editorial Secretary

Assist Prof. Dr. Omar Shamal Farhan

Civil Eng. Dep., Al-Nahrain University, Baghdad, Iraq.

Language Reviewer:

Sheelan S. Kamal

MA English Literature. University of Massachusetts Boston, USA.

The views expressed in this issue are those of the authors and not necessarily of the Editorial Panel



ADVISORY BOARD

1- Prof. Dr. Dermot Brabazon

School of Mechanical and Manufacturing Engineering, DCU, Ireland

2- Prof. Dr. Kevin Chen

Department of Electrical and Computer Engineering, University of Pittsburgh, USA

3- Prof. Dr. Ravi Kant Soni

Indian Institute of Technology Delhi, Hauz Khas, New Delhi, India

4- Prof. Dr. Qassim. J. Slaiman

Dep. of Chemical Engineering, Al-Nahrain University, Iraq

5- Prof. Dr. Albert E. Yousif

Dep. of Biomedical Engineering, Al-Nahrain University, Iraq

6- Prof. Dr. F. M. Al Naima

Dep. of Electronic and Communications Engineering, Al-Mamon University, Iraq

7- Prof. Dr. Waleed K. Hamoudi

Dep. of Applied Science, University of Technology, Iraq

8- Prof. Dr. Jalal M. Jalil

Dep. of Electromechanics Engineering, University of Technology, Iraq

9- Prof. Dr. Khalil I. Al-Ali

Dep. of Architectural Engineering, University of Technology, Iraq

Annual Subscription Fees: 100000 ID (inside Iraq); 100 U.S.\$ (outside Iraq)

Correspondence should be addressed to:

Editor-in-Chief College of Engineering Journal Al-Nahrain University P.O. Box 64040, Al-Jadyriah , Baghdad- Iraq.

Web Site: nahje.com

E-mail: m_editor@nahje.com

jourengnah@gmail.com

Phone No.: +964 (0) 7817202662



FOREWORD

The Editorial Board of Al-Nahrain Journal for Engineering Sciences would like to thank the Dean of the College of Engineering of Al-Nahrain University **Assist. Prof. Dr. Mohammed A. Mohammed** for his continuous encouragement, advice and financial support for this issue.

Special thanks and appreciation are devoted to all members of the Consulting Committee and referees for the great effort spent on the preparation of this issue.

Thanks are extended also to **Mrs. Saja H. Abdulrazaq** who helped in typing and in various operations necessary to produce the manuscript of this number.

The Editorial Board welcomes all comments and constructive criticism from contributors, referees and readers in order to improve the Journal.

Editorial Board