Adnan I. Khdair

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College of Engineering
Mechanical Engineering Department
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1. **Name:** Adnan I. Khdair
   Academic Rank: Professor

2. **Education:**
   B.Sc., Mechanical Engineering,
   Yarmouk University, Irbid-Jordan, Jan. 1986
   M.Sc., Mechanical Engineering
   The Ohio State University, Columbus, Ohio, USA June 1993
   Ph.D., Mechanical Engineering
   The Ohio State University, Columbus, Ohio, USA June 1996

3. **Academic Experience:**

Feb. 2012 – Present	Department of Mechanical Engineering, King Abdulaziz University, KSA, on leave from JUST, Professor
March 2003 – Jan. 2011	Associate Prof. Department of Mechanical Engineering, JUST, Jordan
Sept 2007 – Sept 2008	Department of Mechatronics Engineering, Philadelphia University, Jordan
Sept 1996 – Feb 2003	Assistant Prof. Department of Mechanical Engineering, JUST, Jordan
Sept 1991- June 1996	Research and Teaching Assistant The Ohio State University, Columbus, Ohio, USA

4. **Non-academic Experience:**

June 2005 – Sept 2008	UNDP- Ministry of Environment – Regional Project Manager of the project "*Integrated Waste Management for the Olive Oil Pressing Industries in Lebanon, Syria and Jordan*".

March 2009 – Present	Technical Committee Member of the Jordan National Building Codes Directorate (JNBC) at the Ministry of Public works and Housing
May 1995 – Sept 1996	Design and development Engineer. Luk Inc. Wooster, OH, USA
March 1988 – Sept 1991	Jordan Phosphate Mines Company, Maintenance Engineer Head / Draglines Section
March 1986 – March 1988	Jordan Arm Force, Royal Maintenance Branch, Supply Engineer

5. **Certification and professional registration:**

- Jordanian Professional Engineers Association (JORDAN)
- Jordanian Society for the Control of Environmental Pollution (JORDAN)
- Alpha Epsilon - The Honor Society of Biosystem Engineers (U.S.A)
- Jordanian Association for the Conservation of Water and Environment - JACA Vice Presid.
- Jordan National Building Codes Directorate (JNBC) ***Technical Committee Member*** at the Ministry of Public works and Housing

6. **Current membership in professional organization:**

-Member, American Society of Mechanical Engineers (ASME).
- Member, Jordan National Building Codes Directorate (JNBC).
- Vice President, Jordan Association for the conservation of air, water, and the environment (JACA).
- Member, Alpha Epsilon - The Honor Society of Biosystem Engineers (U.S.A)
- Member, Jordan Association for culture and science.
- Member, Jordan Association for the conservation of Nature.
- Member, International Association of Engineers (IAENG).
- Member, Jordanian Engineers Association (JEA).

7. **Honors and Awards**

- ***Top 2% researcher citation, according to Stanford university. (2025)***
- MS & PhD Scholarship from JUST, 1991-1996
- Research and Teaching Assistant from The OSU, 1992-1995.
- President of Graduate Student Council- The Ohio State University (1993-95)
- Vice President of Alpha Epsilon - The Honor Society of Biosystem Engineers (1992 – 1995)

8. **Service Activities (within and outside of the institution)**

- President, Al-Nakheel Charity Association, Irbid - Jordan
- Academic Accreditation Committee / KSA
- Industrial committee / KSA

9. **Teaching Experience**

Served as Instructor for the following courses:

- Engineering Mechanics (Strength of Material, Dynamic)
- Machines Design I and II
- Senior Graduation Project
- Kinematics and Dynamics of Machinery
- Finite Element Analysis
- Computer Aided Design
- Modeling and Simulations
- Optimization
- Elasticity
- Composite Material
- Engineering Economy
- Experimental Design
- Statistics
- Environmental Control
- Engineering Drawing
- Mechanical Drawing
- Engineering Economy
- Thermodynamic I and II
- Internal Combustion Engines

10. **Thesis Supervision and undergraduate projects**

Supervised many graduate students' thesis and many undergraduate projects in different subjects

11. **Funded Projects:**

Many Distinct Research Study, High Impact Research Publication and General Program Projects were granted and published at (KAU)

12. **Computer Skills**

- Programming Languages: Matlab, Mathematica, Fortran.
- Technical Software: ANSYS, Abaqus, Fluent, SolidWorks, Grapher, Origin

13. **Publications and Presentations from the Last Five Years**

Published 2026

1. **Adnan I. Khadir,** Adnan I Khdair, Ghaida A Aburumman, Farzaneh Tahmasbi, Mohammad Tahmasebi, Rasool Kalbasi, Masoud Afrand, **(2026)**. Advancing natural ventilation in sustainable architecture: mechanisms, innovations, and climate-responsive design for energy-efficient buildings. Renewable and Sustainable Energy Reviews, Volume 226, Part C, January 2026, 11631. https://doi.org/10.1016/j.rser.2025.116314

Published 2025

2. **Adnan I Khdair**, Rasool Kalbasi, Rebwar Nasir Dara, Masoud Afrand, **(2025)**. Phase change materials in buildings: A comprehensive review of applications, climate strategies, and 3E performance. Journal of Energy Storage, 2025, Volume 132, 117675. https://doi.org/10.1016/j.est.2025.117675

3. **Adnan I Khdair**, Ghaida A Aburumman, Shayan Gholipour, Masoud Afrand, **(2025)**. Up-to-date literature review on zero-carbon buildings and cities: energy innovations, challenges, and prospects. Sustainable Energy Technologies and Assessments, 2025, Volume 82,104505. https://doi.org/10.1016/j.seta.2025.104505

4. Lidong Zhu, **Adnan I Khdair**, Alireza Aghaei, Kosar Zalipour, Haiji Chen, Masoud Afrand, **(2025)**. A comprehensive review of solar chimney power plants: technology, performance, and future prospects. Sustainable Energy Technologies and Assessments, 2025, Volume 81, 104413. https://doi.org/10.1016/j.rser.2025.116314

5. **Adnan I Khdair**, Rasool Kalbasi, Rebwar Nasir Dara, Masoud Afrand, **(2025)**. Phase change materials in buildings: A comprehensive review of applications, climate strategies, and 3E performance. Journal of Energy Storage, 2025, Volume 132, Part B, 117675. https://doi.org/10.1016/j.est.2025.117675

6. **Adnan I Khdair**, Ghaida A Aburumman, Shayan Gholipour, Masoud Afrand, **(2025)**. Up-to-date literature review on zero-carbon buildings and cities: energy innovations, challenges, and prospects. Sustainable Energy Technologies and Assessments, 2025, Volume 82, 104505. https://doi.org/10.1016/j.seta.2025.104505

7. Lidong Zhu, **Adnan I Khdair**, Alireza Aghaei, Kosar Zalipour, Haiji Chen, Masoud Afrand, **(2025)**. A comprehensive review of solar chimney power plants: technology, performance, and future prospects. Sustainable Energy Technologies and Assessments 2025, Volume 81, 104413. https://doi.org/10.1016/j.seta.2025.104413

8. Saeed Aghakhani, Ahmad Hajatzadeh Pordanjani, Adnan I Khdair, Alireza Daneh-Dezfuli, **(2025)**. Experimental optimization of a PVT hybrid solar system with v-shaped porous plates and controlled airflow. Renewable Energy, 2025, Part A, 23830. https://doi.org/10.1016/j.renene.2025.123830

9. **Adnan I Khdair**, Saeed Aghakhani, NH Thi, Masoud Afrand, **(2025)**. Molecular dynamics of wettability and condensation on nanostructured surfaces: Fundamentals and hybrid wetting. International Communications in

Heat and Mass Transfer, Volume 161, 108516. https://doi.org/10.1016/j.icheatmasstransfer.2024.108516

10. **Adnan I Khdair**, Ghaida A Aburumman, Shayan Gholipour, Masoud Afrand, **(2025)**. Nanoparticles in water purification: multifunctional roles, challenges, and sustainable applications. Environmental Science: Nano Volume 12 (8): 3871-3895. https://doi.org/10.1039/D5EN00268K

Published 2024

11. Farzaneh Tahmasbi, **Adnan I Khdair**, Ghaida A Aburumman, Mohammad Tahmasebi, NH Thi, Masoud Afrand, **(2024)**. Energy-efficient building façades: A comprehensive review of innovative technologies and sustainable strategies. Journal of Building Engineering. 2024, Volume 99, 111643. https://doi.org/10.1016/j.jobe.2024.111643

12. **Adnan I Khdair**, **(2024)**. Dataset on thermal conductivity of composted olive cake (COC). Data in Brief, 2024, Volume 57, 110939. https://doi.org/10.1016/j.dib.2024.110939

13. **Adnan I. Khadir, (2023)**. Numerical solution for optimization of curved turbulator geometry in a double-pipe heat exchanger containing two-phase Cu-GO/Therminol VP-1 hybrid nanofluid to achieve maximum exergy efficiency. Engineering Analysis with Boundary Elements Volume 155, 2023, Pages 803-813.https://doi.org/10.1016/j.enganabound.2023.07.004.

14. **Adnan I. Khdair**, Thermal-hydraulic performance of a solar collector with twisted vortex generators and hybrid nanofluid: A simulation by numerical method and two-phase model. Engineering Analysis with Boundary Elements, Volume 155, 2023, Pages 1-10, ISSN 0955-7997, https://doi.org/10.1016/j.enganabound.2023.05.039. (https://www.sciencedirect.com/science/article/pii/S0955799723002850)

15. **Adnan I. Khdair**, Ammar A. Melaibari, Experimental evaluation of cut quality and temperature field in fiber laser cutting of AZ31B magnesium alloy using response surface methodology, Optical Fiber Technology, Volume 77, 2023, 103290. ISSN 1068-5200, https://doi.org/10.1016/j.yofte.2023.103290. (https://www.sciencedirect.com/science/article/pii/S106852002300069X)

16. **Adnan I. Khdair**, Numerical simulation of heat transfer of two-phase flow in mini-channel heat sink and investigation the effect of pin-fin shape on flow maldistribution, Engineering Analysis with Boundary Elements, Volume 150, 2023, Pages 385-393, ISSN 0955-7997, https://doi.org/10.1016/j.enganabound.2023.02.017. (https://www.sciencedirect.com/science/article/pii/S095579972300067X)

17. Ladmek, Miloud, Abdelkader Belkacem, Mohammed Sid Ahmed Houari, Ahmed Amine Daikh, Aicha Bessaim, Mohamed Ouejdi Belarbi, Abdelouahed Tounsi, Adnan I. Khdair, and Mohamed A. Eltaher. "On Vibration Responses of Advanced Functionally Graded Carbon Nanotubes Reinforced Composite Nanobeams." Journal of Nano Research. Trans Tech Publications, Ltd., September 5, 2023. Volume 80, Pages 49-63, https://doi.org/10.4028/p-u9expt.

18. **Adnan I. Khdair**, Ghaida Abu Rumman, Adopting PCM and natural ventilation in buildings to reduce energy demand in HVAC -Examining various PCM along with various natural ventilation scenarios, Journal of Building Engineering, Volume 57, 2022, 104770, ISSN 2352-7102, https://doi.org/10.1016/j.jobe.2022.104770. (https://www.sciencedirect.com/science/article/pii/S2352710222007835)

19. **Adnan I. Khadir,** Ahmed B. Khoshaim, Khaled A. Alnefaie. 2022. Evaluation of the effect of filler metal interlayer on the weld joint quality in fiber laser welding of alloy steel (A516). Volume 34 (1), 012011. https://doi.org/10.2351/7.0000580

20. Khdair, IA, GA Rumman, M Basha. 2022. Developing building enhanced with PCM to reduce energy consumption. Volume 48, pp. 103923**.** https://doi.org/10.1016/j.jobe.2021.103923

21. **Khdair, IA,** GA Rumman, M Basha. 2021. Integrating a nanofluid-based solar system with air handling unit to reduce energy usage: Case studies in Saudi Arabia. Journal of the Taiwan Institute of Chemical Engineers. Volume 128, pp. 338-345. https://doi.org/10.1016/j.jtice.2021.06.011.

22. Khdair AI, M Hader, K Abushgair, S Khrais. 2021. Effect of sheet thickness on the fusion zone temperature distribution, melt pool dimensions, mechanical properties, and microstructure in laser welding of Ti6Al4V alloy. Journal of Laser Applications 33 (3), 032005 (2021); https://doi.org/10.2351/7.0000430.

23. A Abidi, **AI Khdair**, R Kalbasi. 2021. Using ANN techniques to forecast thermal performance of a vacuum tube solar collector filled with SiO2/EG-water nanofluid. Journal of the Taiwan Institute of Chemical Engineers. Volume 128, pp. 301-313; https://doi.org/10.1016/j.jtice.2021.06.019.

24. Adnan I. Khadir, Ahmed Amine Daikh, Mohamed A. Eltaher. 2021. Novel Four-Unknowns Quasi 3D Theory for Bending, Buckling and Free Vibration of Functionally Graded Carbon Nanotubes Reinforced Composite Laminated Nanoplates. Advances in Nano Research 2021, 11 (6): 621-640. https://doi.org/10.12989/anr.2021.11.6.621

25. **Khdair, I. A**.; Ghaida Abu-Rumman**.** 2020. Sustainable Environmental Management and Valorization Options for Olive Mill By-products in the Middle East and North Africa (MENA) Region. Processes 2020, 8 (6): 671. https://doi.org/10.3390/pr8060671

26. **Khdair, I. A**.; A. Fathy. 2020. Enhanced strength and ductility of Al-SiC nanocomposites synthesized by accumulative roll bonding. Journal of Materials Research and Technology. 9 (1): 478-489. https://doi.org/10.1016/j.jmrt.2019.10.077

27. **Khdair, I. A**.; A. Fathy. 2021. Effect of graphene addition on physico-mechanical and tribological properties of Cu-nanocomposites. International Journal of Minerals, Metallurgy and Materials. 29:1-7. https://dx.doi.org/10.1007/s12613-020-2183-0

28. Ghaida Abu-Rumman; **Khdair, I. A**; Sawsan I. Khdair. 2020. Current Status and Future investment Potential in Renewable Energy in Jordan: an overview. Heliyon 6 (2): e03346. https://doi.org/10.1016/j.heliyon.2020.e03346

29. **Khdair, I. A**.; Ghaida Abu-Rumman; Sawsan I. Khdair 2019. Pollution estimation from olive mills wastewater in Jordan. Heliyon e02386. https://doi.org/10.1016/j.heliyon.2019.e02386.

30. **Khdair, I. A.**, Sawsan I. Khdair Ghaida Abu-Rumman. (2019) Dataset on some soil properties improvement by the addition of olive pomace. Data in brief 24 (2109) 103878**.** https://doi.org/10.1016/j.dib.2019.103878

31. **Khdair, A. I.**, G. Abu-Rumman, and S. I. Khdair. 2018. Evaluation the mechanical harvesting efficiency of olive with the application of fruit loosening spray. Agricultural Engineering International: CIGR Journal, 20 (4): 69–75.

32. **Khdair, I. A**.; Ghaida Abu-Rumman. 2017. Evaluation of the environmental pollution from olive mills wastewater. Fresenius Environmental Bulletin 26 (4): 2537-2540**.**

33. Khashaba U.A.**, Khdair, A.I.** 2017. Open hole compressive elastic and strength analysis of CFRE composites for aerospace applications. Aerospace Science and Technology 60: 96-107. http://dx.doi.org/10.1016/j.ast.2016.10.026

14. Professional Development Activities

Workshops attended:

- THE MENA UNIVERSITIES SUMMIT. Jeddah, KSA, March 19-21, 2018. King Abdulaziz University.
- High Performance e-Computing Saudi Arabia. Jeddah, KSA, March 19-21, 2018. King Fahd Medical Research Center, KAU.

- International Conference on Smart Societies Infrastructure, Technologies, and Applications. Jeddah, KSA, November 27-29, 2017. King Abdulaziz University.
- The application of nanotechnology in the environment. Jeddah, KSA, January 20-21, 2015. King Abdulaziz University,
- National Road-Map for harmonized legal and regulatory framework for Renewable Energy and Energy Efficiency and on Project Financing. Amman, December 12, 2011.
- The First International Conference on Environmental Management and Technologies – ICEMT 2010. Amman, November 1-3, 2010. ***ICEMT 2010 International Scientific Committee member.***
- The Third Arab Cleaner Production Workshop. Royal Scientific Society (RSS) Amman. February 2nd-4th, 2009.

- Online Learning Design, 2018

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