Ahmad Aljabr

Associate Professor, Mechanical and Industrial Engineering Department, Majmaah University, 11952, Saudi Arabia.
Email: AA.ALJABR@MU.EDU.SA

❒ Education:

Ph.D., Mechanical and Aerospace Engineering Department, 2016 - 2021.
University of Dayton, Dayton, OH, USA.

MSc, Mechanical and Aerospace Engineering Department, 2013 - 2015.
University of Dayton, Dayton, OH, USA.

BSc, Mechanical Engineering Department, 2010.
Qassim University, Saudi Arabia.

❒ Experience:

08/2021 – now **Associate Professor, Majmaah University:**

Supervisor: Ranking Department, Vice Rector's Office for Graduate Studies and Scientific Research: January 2024 – now.
Member: Research Center of Engineering & Applied Science, Deanship of Scientific Research: June 2022 – now.
Member: Training and Scholarship Committee, Administration of Training and Scholarship: February 2024 – March 2025.
Member: Late Excellence Allowance Applications Committee, Secretary Scientific Council: June 2025 – now.
Member: Quality Assurance Unit, College of Engineering: October 2021 – December 2022.
Member: Planning and Development Unit, College of Engineering: October 2021 – December 2022.
Member: Scientific Research Unit, College of Engineering: December 2023 – now.
Member: Student Violations Committee, College of Engineering: September 2022 – now.
Coordinator: Alumni Committee, Mechanical and Industrial Engineering Department: October 2022 – August 2024.
Coordinator: Student Activities & services Committee, Mechanical and Industrial Engineering Department: January 2024 – now.
Coordinator: Innovation & Entrepreneurship Committee, Mechanical and Industrial Engineering Department: August 2024 – January 2025.
Member: Community Service Committee, Mechanical and Industrial Engineering Department: August 2022 – August 2023.

Member: Engineering Practice & Senior Design Committee, Mechanical and Industrial Engineering Department: August 2023 – now.
Courses: Turbomachinery, Turbulent Flow, Automatic Control, Mechanical Vibrations, Mechanical Engineering Drawing, Senior Design.

01/2019 – 08/2021 **Research Assistant, University of Dayton:**
Research Project: Designing and Conducting Thermal Response Tests (TRT) in a Vertical Ground Heat Exchanger Intermixed with Microencapsulated Paraffin-Based Phase Change Material.
Courses: Geothermal Energy Systems, Energy Systems Engineering, Solar Energy Systems.

11/2010 – 05/2012 **Teaching Assistant, Qassim University:**
Courses: Heat Transfer Lab, Fluid Lab.
Member: Alumni Committee, Mechanical Engineering Department.
Member: Career Day Fair, Deanship of Student Affairs.

07/2009 – 01/2010 **Cooperation Training, Saudi Basic Industries Corporation (SABIC):**
Cold Mill Complex: Pressing mill, slitting line, and galvanizing line.
Quality Control Unit: inspection and testing workshop.

06/2008 – 08/2008 **Summer Training Program, Saudi Arabian Oil Company (ARAMCO).**
Piping and Valves Department: Assisting in conducting studies and analysis for piping, valves, flange, and nozzles.

❒ Certificates and Achievements:

- Distinguished Researcher Award at Majmaah University: February 2025.
- King Abdullah Petroleum Studies and Research Center Award, second place - Scientific Article Category: December 2024.
- DL-101 Intellectual Property Fundamentals Certificate, the World Intellectual Property Organization Academy (WIPO): September 2024.

❒ Community Service and Volunteering:

- Member: Project Management Institute.
- Member: American Society of Mechanical Engineers.
- Third Engineering Conference, February 2023: Chair of two sessions.
- First Research School, May 2024: two workshops.
- Judging student projects in research and hackathons.
- Second Research School, October 2024: two workshops.
- Workshop: Using Technology and Artificial Intelligence in Research, November 2024.
- Review of more than 25 scientific papers in scientific journals indexed in the Web of Science.
- Workshop: Artificial Intelligent (AI) in MATLAB (2021).

- Workshop: Programing by MATLAB for Engineers (2020).
- Workshop: CFD Analyzing and Testing via COMSOL (2019).
- Member of Saudi Student Club in University of Dayton (2015).

❒ Selected Workshops:

- Academic Project Management: May 2025.
- Scientific Societies (Establishment, Objectives and Governance): February 2025.
- Artificial Intelligence and CEOs: January 2025.
- Development Project Management Professional Certificate: The Path to Achieving the 2030 Sustainable Development Goals Initiatives: May 2024.
- Social innovation role in achieving the 2030 Sustainable Development Goals: April 2024.
- A New Perspective on Accelerating the Role of Universities in Implementing the United Nations Sustainable Development Goals 2030: January 2024.
- Integration between education and training institutions and labor market in the energy sector: January 2024.
- Artificial intelligence tools in developing scientific research: October 2023.
- Graduate characteristics and learning outcomes: October 2023.
- Government Communication: February 2023.
- Organizational Structure Building Skills: January 2023.
- Academic Leadership Development Workshop (Saudi Arabian Cultural Mission in USA, 2019).
- Building Skills Through Volunteering (Saudi Arabian Cultural Mission in USA, 2016).

❒ Conferences:

- Human Capability Initiative (HCI) 2025: Riyadh, KSA, 2025.
- The International Conference: Universities and Sustainable Development Goals 2030 "Targets and Practices", Majmaah, 2024: presenting a workshop.
- Global Artificial Intelligence Summit (GAIN), Riyadh, KSA, 2024.
- Renewable Energy Engineering Forum and Exhibition: Majmaah, KSA, 2023: coordinator.
- 44th International Conference of the International Association for Energy Economics (Iaee), Riyadh, KSA, 2023.
- International Engineering Conference and Exhibition, Riyadh, KSA, 2023.
- ASME 2019 International Mechanical Engineering Congress and Exposition, Salt Lake City, USA: presenting two papers.
- ASME 2018 International Mechanical Engineering Congress and Exposition, Pittsburgh, USA: presenting two papers.
- ASME 2018 Power & Energy Conference and to Orlando, Florida.

❒ Research Interests:

Geothermal Energy Systems; Renewable Energy systems; Energy Efficiency; CFD; Thermal systems modeling; Solar Energy Systems.

❒ Researchers Grants:

- Designing and Conducting Thermal Response Tests (TRT) in a Vertical Ground Heat Exchanger: (Funded by Department of Energy in USA, Small Business Innovation Research program 2019).
- Reliability of the smart operation of transmission lines in grids that feature integrated low-carbon technologies: (Funded by Ministry of Education in Saudi Arabia 2022).
- A Comprehensive Experimental and Analytical Investigation into Advanced Membrane Distillation Optimization: Leveraging Artificial Intelligence for Predictive Analysis and Assessment of Sustainable Hybrid Energy Systems Integration: (Funded by Research, Development, and Innovation Authority in Saudi Arabia 2024).

❒ Research Projects:

- Designing and Conducting Thermal Response Tests (TRT) in a Vertical Ground Heat Exchanger: 2021.
- Designing and Conducting Thermal Response Tests (TRT) in a Vertical Ground Heat Exchanger Intermixed with Microencapsulated Paraffin-Based Phase Change Material: 2020.
- Optimizing Protection of Pallet Truck Packaging During Transit in Overseas Container, CROWN Corp: 2019.
- Designing and Studying the Performance of Double Acting Solar Cabinet Dryer Suitable Qassim Environment: 2010.
- Designing a Refrigeration System Supported by A Heat Sink of Ice Made at Low-Load Period in Qassim Province: 2010.

❒ Language Skills:

Arabic: native.
English: excellent.

❒ Digital Skills:

MATLAB; Python; COMSOL Multiphysics; ANSYS Fluent; TRNSYS; EES; AutoCAD; SolidWorks.

❒ Selected Publications:

S. A. Marzouk, Fahad Almehmadi, Ahmad Aljabr, Saad Alshammari, Maisa A. Sharaf. Experimental and numerical study of Tesla valve integration in photovoltaic/thermal system. Energy. 2025. 341.

Ahmad Aljabr. Enhancing Thermal Performance of Vertical Ground Heat Exchangers Through a Central Borehole Removal Design. *Processes*. 2025. 13(2).

S.A. Marzouk, Fahad Almehmadi, Ahmad Aljabr, Amr Kaood. Performance analysis of twisted tape inserts and nanofluids in double-pipe helical coil heat exchangers. *Journal of Thermal Analysis and Calorimetry*. 2025.

Emad M.S. El-Said, Maisa A. Sharaf, Ahmad Aljabr, S.A. Marzouk. Enhancing the performance of an earth air heat exchanger with novel pipe configurations. *International Journal of Heat and Fluid Flow*. 2024. 110.

S.A. Marzouk, Ahmad Aljabr, Fahad Almehmadi, Maisa Sharaf. Enhancing heat transfer in a double-tube heat exchanger using perforated twisted tape and nanofluid. *Journal of Thermal Analysis and Calorimetry*. 2025. 150.

Amr Alhajjaji, Andrew Chiasson, Ahmad Aljabr. Simulation-Based Analysis of a Novel CO2 Ground Source Heat Pipe (GSHP) to Reduce Temperature Fluctuations in Pavements in Different Climatic Conditions. *Energies*, 2022; 15(9).

S.A. Marzouk, Fahad Almehmadi, Ahmad Aljabr, Maisa Sharaf. Improving thermal and electrical efficiency in photovoltaic/thermal systems using different baffle types. *Applied Thermal Engineering*. 2025. 278, Part C.

Shehab Abd Elfadeel, Muhammed Hassan, Ahmad Aljabr, Bader Alharbi. Performance characterization of a novel integrated radiant wall system for sustainable heating. *Journal of Thermal Analysis and Calorimetry*. 2024. 149.

S.A. Marzouk, Ahmad Aljabr, Fahad Almehmadi, Tabish Alam, Dynamic thermal analysis and drill bit temperature in AISI 430 stainless steel. *Thermal Science and Engineering Progress*. 2024. 53.

Ahmad Aljabr, Sulaiman Almoatham, The potential of utilizing vertical borehole heat exchangers in residential buildings for the various climate zones of Saudi Arabia. *Geothermics*. 2024. 122.

Ahmad Aljabr. Investigation on the influence of mixed borehole depths in vertical ground heat exchanger systems. *Geothermics*. 2024. 119.

Anas Alwatban, Ahmad Aljabr. Thermo-flow behavior of air-channel heat exchanger with nonidentical baffle lengths: computational analysis. *Journal of Thermal Analysis and Calorimetry*. 2024. 149.

Ahmed Al-darraji, Seifelislam Marzouk, Ahmad Aljabr, et al. Enhancement of heat transfer in a vertical shell and tube heat exchanger using air injection and new baffles: Experimental and numerical approach. *Applied Thermal Engineering* 236A, 121493 (2023).

Wei Liu, Jiashen Teh, Bader Alharbi, …, Ahmad Aljabr, et al. An electric-thermal coupling modeling method for lithium-ion battery using the state of charge normalization calculation method. *Journal of Energy Storage* 72E, 108724 (2023).

Seifelislam Marzouk, Ahmad Aljabr, Fahad Almehmadi, et al. Numerical study of heat transfer, exergy efficiency, and friction factor with nanofluids in a plate heat exchanger. *J Therm Anal Calorim* 148, 11269–11281 (2023).

Ching-Ming Lai, …, Ahmad Aljabr, Naif Alshammari (2023). Optimization of generation unit commitment and network topology with the dynamic thermal rating system considering N-1 reliability. *Electric Power Systems Research*, 2023, 221, 109444.

Ahmad Aljabr, Andrew Chiasson (2023). Numerical Modeling of the Effects of the Radial and Axial Location of Added Micro-Encapsulated Phase Change Materials in Grouts of Vertical Borehole Heat Exchangers. *Geothermics*.

Amr Alhajjaji, Andrew Chiasson, Ahmad Aljabr. Simulation-Based Analysis of a Novel CO2 Ground Source Heat Pipe (GSHP) to Reduce Temperature Fluctuations in Pavements in Different Climatic Conditions. *Energies*. 2022; 15(9):3343.

Ahmad Aljabr, Andrew Chiasson, Amr Alhajjaji (2021). Numerical Modeling of The Effects of Micro-Encapsulated Phase Change Materials Intermixed with Grout in Vertical Borehole Heat Exchangers. *Geothermics*. *Volume 96*.