

# Ala'a M. Al-Falahat, Ph.D., M.Sc, B.Sc



Ph.D. (Mechanical Engineering, Applied and Materials Science), Germany  
M.Sc. (Mechanical Engineering, renewable energy), Jordan  
B.Sc. (Mechanical Engineering), Jordan

**Nationality:** Jordanian

**Date of Birth:** 1984

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**Academic Rank:** Associate professor

## Biography

Dr. Ala'a Al-Falahat is currently an associate professor at Mutah University in Jordan. He earned his PhD in Mechanical Engineering from the Technical University Berlin, Germany (2019) and an M.Sc from the University of Jordan (2012). Currently, Dr. Al-Falahat heads the Mechanical Engineering Department at Mutah University. He also has 5 years of practical experience in the field of design and contracting companies.

## Education

### Technical University of Berlin

PhD degree in mechanical engineering, Applied Mechanics and materials science

Berlin, Germany

Sep. 2019

### University of Jordan

M.Sc. degree in mechanical engineering, Renewable Energy

Amman, Jordan

Dec. 2011

### Mutah University

B.Sc degree in Mechanical Engineering

Al-Karak, Jordan

Jan. 2007

### Madaba Secondary School

High School certificate

Madaba, Jordan

Aug. 2002

## Research interests

- Mechanical Dynamics and Control system
- Mechanical Vibration
- Kinematics and kinetics of bodies and particles
- Theory of machines
- Engineering Analysis and Numerical
- Renewable energy systems
- Material Science
- Microstructure and phase transformation,
- Neutron Imaging

- Neutron Scattering/Diffraction

### Research Grants

- Materials Science and Energy Lab (MSEL) Establishment (\$250,000, 3 years), Deanship of Scientific Research, Mutah University, 2020.

### Scholarships

- Recipient of Prestigious Scholarship from Mutah University for graduate studies.

### Professional research profiles

- [Scopus Profile](#)
- [Google Scholar Profile](#)
- [ResearchGate Profile](#)

### Teaching Experiences

#### Associate Professor/ Mutah University

Al-Karak, Jordan  
Dec,2024-Present

**Courses:** Advanced Vibrations: Theory and Application, Advanced Engineering Analysis  
Engineering Mechanics: Dynamics and Numerical Methods

- Teaching, Curriculum Development, and Mentoring and Advising.
- Research, Service and Committee Work, and Professional Development.

#### Assistant Professor/ Mutah University

Al-Karak, Jordan  
Sep, 2019-Dec, 2024

**Courses:** Mechanical Vibration, Mechanical Control, Theory of Machines, Engineering  
Mechanics: Dynamics, Strength of Materials, Probabilities and Statistics for Engineering,  
Engineering analysis and Numerical methods

- Teaching, Curriculum Development, and Mentoring and Advising.
- Research, Service and Committee Work, and Professional Development.

#### Full-time Instructor/ Mutah University

Al-Karak, Jordan  
Sep. 2012-Sep.2014

**Courses:** Thermodynamics I and II, Fluid Mechanics, Internal combustion Engine, Heat  
Transfer, Probabilities and Statistics for Engineering and Principles of Mechanics and  
Maintenance of Automobiles

#### Teacher Assistant/ University of Jordan

Amman/Jordan  
Sep.2008-Sep.2009

**Courses:** Engineering Analysis, Probabilities and Statistics for Engineering

- Developing course materials and facilitating student learning.

### Administrative Roles/ Mutah University

- **Chairman of Mechanical Engineering Department** Sep. 2023-Present
- **Committee Head, Accreditation (ABET).** Mar.2022-present
- **Member, Department Labs Development Committee** Sep. 2023-Present
- **Member, Course Equivalency Committee.**
- **Member, Distance Education Committee.**
- **Member, Quality Control Committee.**

### Technical Experiences

#### Ministry of Education in Jordan, Buildings and Maintenance Department Sep. 2011-Dec.2012

- Planning and Design
- Construction of New Buildings
- Regular and Emergency Maintenance
- Building Condition Assessment and Budget Management:
- Enhancing the Educational Environment:

#### Tanfeeth Contracting Company, Design Engineer Aug. 2010-Sep.2011

- Study Drawings and Specifications: Review project blueprints and ensure they meet the required specifications. Verify that mechanical systems (like HVAC, plumbing, and fire protection) comply with engineering codes and standards.
- Site Supervision: Monitor on-site work to ensure tasks are completed correctly and to high standards. Ensure the team follows the project's timeline and schedule.
- Supplier Coordination: Select materials and equipment that meet project requirements. Oversee the procurement process and ensure timely delivery of all needed components.
- Problem-Solving: Address any challenges that arise during execution with efficient technical solutions. Work closely with engineers and technicians to resolve site issues.
- System Testing: Conduct testing and commissioning of mechanical systems to confirm proper functionality. Prepare inspection reports and ensure all documentation is complete before project handover.

#### Al-Awabeen contracting company, Design Engineer Mar 2007-Aug.2010

- Study Drawings and Specifications
- Site Supervision
- Problem-Solving
- System Testing

### Workshops

#### Mutah University Training Programs

- Electronic content development training course. (12 hours). The Center for Academic Development and Quality Assurance, Mutah University, Jordan. (2024).

- Academic leadership. (6 hours). Academic Development and Quality Assurance Center, Mutah University, Jordan. (2023).
- Developing a curriculum with a distinctive learning experience. (6 hours). Academic Development and Quality Assurance Center, Mutah University, Jordan. (2023).
- Preparing research and scientific research projects. (6 hours). Academic Development and Quality Assurance Center, Mutah University, Jordan. (2023).
- Modern statistical methods. (3 hours). Academic Development and Quality Assurance Center, Mutah University, Jordan. (2023).
- E-learning. (9 hours). Academic Development and Quality Assurance Center, Mutah University, Jordan. (2023).
- Course material design. (4 hours). Academic Development and Quality Assurance Center, Mutah University, Jordan. (2021).
- E-learning. (9 hours). Academic Development and Quality Assurance Center, Mutah University, Jordan. (2021).
- University education ethics. (2 hours). Academic Development and Quality Assurance Center, Mutah University, Jordan. (2021).
- Classroom management and organization. (4 hours). Academic Development and Quality Assurance Center, Mutah University, Jordan. (2021).
- Teaching methods and modern education. (6 hours). Academic Development and Quality Assurance Center, Mutah University, Jordan. (2021).
- Student Assessment Strategy. (5 hours). Academic Development and Quality Assurance Center, Mutah University, Jordan. (2021).

### Skills

➤ MATLAB	➤ Ansys	➤ Origin Lab	➤ Monte Carlo Simulation
➤ AutoCAD	➤ Pythons	➤ Ms Office	➤ Solidworks
➤ Image. J	➤ Octopus	➤ English	➤ Arabic

### Publications: Scopus H-Index = 13

Export Date: 14 Jan 2025

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- 1) Alrashed, S.S., Almajali, M.R., Alsaraireh, F.M., Al-Falahat, A.M. **Green performance enhancement of marine engines via turbocharger compression ratio optimization** (2024) Results in Engineering, 24, art. no. 102989, .
- 2) Al-Falahat, A., Kardjilov, N., Markötter, H., Kupsch, A., Woracek, R., Alrashed, S., Manke, I. **Investigation of detector backlighting and other effects in neutron darkfield images** (2024) Instrumentation Science and Technology, .

3) Al-Falahat, A., Kardjilov, N., Woracek, R., Alwashdeh, S., Murtadha, T.K., Manke, I. **Advanced Corrections of wavelength-resolved neutron transmission imaging** (2023) European Physical Journal Plus, 138 (9), art. no. 840, . Cited 1 time.

4) Al-Falahat, A., Kardjilov, N., Murtadha, T.K., Woracek, R., Alwashdeh, S., Manke, I. **Higher order correction and spectral deconvolution of wavelength-resolved neutron transmission imaging at the CONRAD-2 instrument** (2023) Results in Optics, 12, art. no. 100480, . Cited 2 times.

5) Al-Falahat, A. **Analysis and modelling of the rotor dynamics of a composite hollow shaft using finite element Techniques** (2023) International Journal of Advanced Technology and Engineering Exploration, 10 (101), pp. 485-497.

6) Jamro, R., Mente, T., Kardjilov, N., Markötter, H., Al-Falahat, A.M., Woracek, R., Manke, I., Griesche, A. **Temperature distribution during welding measured by neutron imaging** (2023) Journal of Physics: Conference Series, 2605 (1), art. no. 012026, .

7) Alwashdeh, S.S., Al-Falahat, A.M., Markötter, H., Manke, I. **Visualization of water accumulation in micro porous layers in polymer electrolyte membrane fuel cells using synchrotron phase contrast tomography** (2022) Case Studies in Chemical and Environmental Engineering, 6, art. no. 100260, . Cited 12 times.

8) Abu Qadourah, J., Al-Falahat, A.M., Alwashdeh, S.S., Nytsch-Geusen, C. **Improving the energy performance of the typical multi-family buildings in Amman, Jordan** (2022) City, Territory and Architecture, 9 (1), art. no. 6, . Cited 30 times.

9) Murtadha, T.K., Dil Hussein, A.A., Alalwany, A.A.H., Alwashdeh, S.S., Al-Falahat, A.M. **Improving the cooling performance of photovoltaic panels by using two passes circulation of titanium dioxide nanofluid** (2022) Case Studies in Thermal Engineering, 36, art. no. 102191, . Cited 38 times.

10) Al-Falahat, A.M., Kardjilov, N., Woracek, R., Boin, M., Markötter, H., Kuhn, L.T., Makowska, M., Strobl, M., Pfretzschnner, B., Banhart, J., Manke, I. **Temperature dependence in Bragg edge neutron transmission measurements** (2022) Journal of Applied Crystallography, 55, pp. 919-928. Cited 9 times.

11) Alwashdeh, S.S., Qadourah, J.A., Al-Falahat, A.M. **Investigation of the Effect of Roof Color on the Energy Use of a Selected House in Amman, Jordan** (2022) Frontiers in Mechanical Engineering, 8, art. no. 897170, . Cited 12 times.

12) Alwashdeh, S.S., Al-Falahat, A.M., Murtadha, T.K. **Effect of Turbocharger Compression Ratio on Performance of the Spark-Ignition Internal Combustion Engine** (2022) Emerging Science Journal, 6 (3), pp. 482-492. Cited 24 times.

13) Al-Falahat, A.M. **IMPLEMENTATION OF THE DYNAMIC BALANCING APPROACH OF A ROTATING COMPOSITE HOLLOW SHAFT** (2022) EUREKA, Physics and Engineering, 2022 (2), pp. 68-73. Cited 1 time.

14) Altarawneh, O.R., Alsarayreh, A.A., Al-Falahat, A.M., Al-Kheetan, M.J., Alrwashdeh, S.S. **Energy and exergy analyses for a combined cycle power plant in Jordan** (2022) Case Studies in Thermal Engineering, 31, art. no. 101852, . Cited 39 times.

15) Al-Falahat, A.M., Qadourah, J.A., Alrwashdeh, S.S., khater, R., Qatlama, Z., Alddibs, E., Noor, M. **Energy performance and economics assessments of a photovoltaic-heat pump system** (2022) Results in Engineering, 13, art. no. 100324, . Cited 59 times.

16) Alrwashdeh, S.S., Ammari, H., Madanat, M.A., Al-Falahat, A.M. **The Effect of Heat Exchanger Design on Heat transfer Rate and Temperature Distribution** (2022) Emerging Science Journal, 6 (1), pp. 128-137. Cited 34 times.

17) Alrwashdeh, S.S., Ammari, H., Jweihan, Y.S., Qadourah, J.A., Al-Kheetan, M.J., Al-Falahat, A.M. **Refurbishment of Existing Building toward a Surplus Energy Building in Jordan** (2022) Open Construction and Building Technology Journal, 16 (1), art. no. e187483682208150, .Cited 11 times.

18) Abu Qadourah, J., Alfalalahat, A.M., Alrwashdeh, S.S. **Assessment of solar photovoltaics potential installation into multi-family building's envelope in Amman, Jordan** (2022) Cogent Engineering, 9 (1), art. no. 2082059, . Cited 21 times.

19) Qadourah, J.A., Al-Falahat, A.M., Alrwashdeh, S.S. **INVESTIGATE THE CARBON FOOTPRINTS OF THREE INTERMEDIATE FLOORING SYSTEMS: CROSS-LAMINATED TIMBER, SOLID CONCRETE, AND HOLLOW-CORE PRECAST CONCRETE** (2022) Journal of Applied Engineering Science, 20 (2), pp. 377-385. Cited 10 times.

20) Al-Falahat, A.M., Qadourah, J.A., Alrwashdeh, S.S. **ECONOMIC FEASIBILITY OF HEATING SOURCE CONVERSION OF THE SWIMMING POOLS** (2022) Journal of Applied Engineering Science, 20 (1), pp. 230-238. Cited 15 times.

21) Al-Falahat, A.M. **Examination of the Dynamic Behaviour of the Composite Hollow Shafts Subject to Unbalance** (2021) International Journal of Mechanical Engineering and Robotics Research, 10 (10), pp. 572-576. Cited 8 times.

22) Al-Falahat, A.M., Kupsch, A., Hentschel, M.P., Lange, A., Kardjilov, N., Markötter, H., Manke, I. **Correction approach of detector backlighting in radiography** (2019) Review of Scientific Instruments, 90 (12), art. no. 5097170, . Cited 17 times.

23) Al-Falahat, A.M., Kardjilov, N., Khanh, T.V., Markötter, H., Boin, M., Woracek, R., Salvemini, F., Grazzi, F., Hilger, A., Alrwashdeh, S.S., Banhart, J., Manke, I. **Energy-selective neutron**

imaging by exploiting wavelength gradients of double crystal monochromators—Simulations and experiments (2019) Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, 943, art. no. 162477, . Cited 26 times.

24) Alrwashdeh, S.S., Manke, I., Markötter, H., Haußmann, J., Arlt, T., Hilger, A., Al-Falahat, A.M., Klages, M., Scholte, J., Banhart, J. **Improved Performance of Polymer Electrolyte Membrane Fuel Cells with Modified Microporous Layer Structures** (2017) Energy Technology, 5 (9), pp. 1612-1618. Cited 34 times.

25) Alrwashdeh, S.S., Manke, I., Markötter, H., Haußmann, J., Kardjilov, N., Hilger, A., Kermani, M.J., Klages, M., Al-Falahat, A.M., Scholte, J., Banhart, J. **Neutron radiographic in operando investigation of water transport in polymer electrolyte membrane fuel cells with channel barriers** (2017) Energy Conversion and Management, 148, pp. 604-610. Cited 60 times.

26) Falahat, A.M., Hamdan, M.A., Yamin, J.A. **Engine performance powered by a mixture of hydrogen and oxygen fuel obtained from water electrolysis** (2014) International Journal of Automotive Technology, 15 (1), pp. 97-101. Cited 23 times.

**References: Available Upon Request.**