Dr Shara Kamal Mohammed

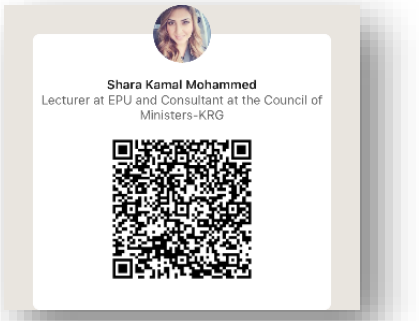
BSc, MSc, PhD, FHEA

LinkedIn • ORCID ID • Research Gate • Google Scholar

• Scopus Author ID: 57200070439

• Web of Science ResearcherID: AAG-3271-2020

• EPU Academic Staff



Erbil, Kurdistan Region +44 7450 559440

+ 7504232382

shara.mohammed@rpu.edu.iq

shara.kamal@com.gov.krd

Objective

Academic department head supporting institutional priorities through committee leadership, stakeholder coordination, and technical input. Engineering foundation (PhD, University of Nottingham) with strong practical experience in experimental systems, laboratory development, and measurement-based problem solving. Strong research capability demonstrated through peer-reviewed publications in International Journals and continued research activity within academic collaborations with International Universities. Experienced in teaching and capacity building through delivering engineering modules, leading laboratory sessions, training demonstrators, and supervising undergraduate graduation projects. International engagement includes COP28 and COP29, linking engineering evidence to sustainability and resilience priorities.

Experience

Sep 2024–Present

Head of Department • Department of Petroleum Technology • Erbil Polytechnic University (EPU)

- Lead departmental operations and coordination across teaching and academic delivery.
- Support planning and implementation of department priorities with internal stakeholders.

Aug 2023–Present

Part-Time Adviser • Environment and Climate Change • Presidency of the Diwan, Council of Ministers (KRG)

- Provide climate-change advisory support aligned with government priorities and institutional coordination needs.

- Contribute through committee participation and coordination with partner programmers (KRG–UNDP workstreams).
- Participate/represent in international climate processes, including COP28 (2023), UN SB60 (2024), and COP29 (2025).

June 2023–Oct 2025
Academic and Research Associate • **Chemical and Environmental Engineering** • **The University of Nottingham, United Kingdom**

- Research and academic activity within Chemical & Environmental Engineering.
- Led laboratory sessions and trained/mentored demonstrators supporting undergraduate students.
- Built collaboration links (including a collaboration established with the University of Hull, Chemical Engineering Department).

Nov 2018–May 2023
Technical specialist and Research fellow • **Chemical and Environmental Engineering** • **The University of Nottingham, United Kingdom**

- Research in chemical/environmental engineering, experimental work, academic teaching, and publication outputs.

July 2017–Nov. 2018
Full-time lecturer • Department of Petroleum Technology • The Institute of Technology, Erbil **Polytechnic University**, Erbil, Kurdistan Region

July 2017–Nov. 2018
Academic Associate • Chemical and Environmental Engineering • The University of **Nottingham**, United Kingdom

Sep. 2009–Aug. 2011
Full-time **lecturer** • Cooling and Refrigerating Equipment Department • The Institute of Technology, Erbil Polytechnic **University**, Erbil, Kurdistan Region.

May 2009–Aug. 2011
Part-time **Adviser** (higher education) to the President of KRG **Parliament** • Kurdistan Parliament, Kurdistan Region

July 2007–May 2009
Part-time **Adviser** (higher education) to the Vice President of KRG **Parliament** • Kurdistan Parliament, Kurdistan Region

April 2004–Oct. 2006
Part-time **lecturer** • Mechanical Department • Technical **Institute**, Kirkuk
Full-time **project management** • Engineering Projects Unit, The Institute of Technology/Erbil, Erbil Polytechnic **University**, Erbil, Kurdistan Region

Sep. 2002–April 2004
Part-time **lecturer** • Mechanical Department • Technical **Institute**, Kirkuk

Research Experience

My PhD research investigated Oil and Gas flow behaviour in large-diameter columns. Using two large-scale columns, I compared flow development across geometries and applied high-resolution diagnostics, including electrical capacitance tomography (ECT) and high-speed imaging. This work advanced understanding of multiphase flow in highly viscous systems and supported peer-reviewed publications, including a 2018 paper in the International Journal of Multiphase Flow on churn-flow hydrodynamics in large-diameter, high-viscosity conditions.

Beyond this, I have strong experimental engineering experience in laboratory development. At the University of Nottingham, I commissioned a newly manufactured sensor from HZDR, calibrated the Multiple Probe Film Sensor (MPFS), and designed and built a dedicated falling-film rig to measure interfacial film characteristics in large-diameter pipes. Results from this program were published in Chemical Engineering Research and Design. Overall, my research outputs include multiple journal and conference publications, as well as a book on photovoltaic systems.

More recently, my research has expanded toward environmental pollution and greenhouse gas emissions in the Kurdistan Region of Iraq, linking engineering analysis with practical mitigation pathways. This includes assessing emissions from fossil-fuel-based activities across energy and oil and gas systems and developing sectoral mitigation options and MRV-oriented frameworks. In related work, I contributed to technical analysis of mitigation actions across electricity, industry, waste, transport, buildings, and AFOLU highlighting data gaps, institutional readiness challenges, and the need for consistent measurement, reporting, and verification to support implementation. In parallel, I have undertaken applied environmental work using geoinformatics (e.g., satellite-based NO_2 assessment over Erbil) to support evidence-based understanding of air quality and emissions.

I am also an active peer reviewer for journals in my field (including petroleum, fluid mechanics, and chemical engineering), and a member of the Fluid and Thermal Engineering Research Group at the University of Nottingham. My earlier engineering work includes designing photovoltaic power systems, which formed the basis of my MSc research at Salahaddin University.

Teaching Experience

I have taught in higher education since 2002, beginning with Mechanical Engineering and Engineering/Mechanical Drawing after completing my BSc in Fuel and Energy Engineering, and later progressing to Fluid Mechanics and Heat Transfer (lectures and laboratory practicals) following my MSc in Mechanical Engineering (Thermal Power). During my PhD and subsequent roles at the University of Nottingham, I contributed directly to laboratory teaching in Chemical

and Environmental Engineering by supporting first- and third-year practical modules, training demonstrators who supervised student groups, and leading laboratory sessions. This role also involved pre-session preparation and equipment troubleshooting, developing and commissioning laboratory rigs, and updating operational procedures and process risk assessments to support the safe and effective delivery of practicals.

Education

The University of Nottingham, Nottingham, United Kingdom
PhD in Chemical and Environmental Engineering, Sep. 2012 –Jul 2017.
Subject: Gas-Oil flow in large-scale columns.

Salahaddin University, Erbil, Kurdistan Region
MSc in Mechanical Engineering/ Thermal Power, College of Engineering, Oct. 2006- Sep.2009
Subject: Solar power, Photovoltaic systems

Engineering Technical College, University of Kirkuk, Kirkuk, Iraq
BSc in Fuel and Energy Technical Engineering, Sep.1998-Jul. 2002

Core Competencies

- Policy and technical advisory support (Energy, Environmental pollution, Climate Change, Higher Education)
- Project and programme coordination: workstreams, follow-up, stakeholder management
- Committee leadership and governance support
- Reporting, presentations, workshops, and facilitation (government and international forums)
- Capacity building and staff development support

Governance, Committees, Programs

- Head, Flood Mapping and Management Project in Kurdistan (EPU & IOM).
- Head, “Toward placing Kurdistan on the global green map” committee (EPU).
- Head of Petroleum Technology’s Examination Committee.
- Member, Coordination Committee Climate Investment Plan (KRG–UNDP).
- Member, Local Appropriate Mitigation Plan Committee (KRG–UNDP).
- Member, Biannual Transparency Report Committee (KRG–UNDP).

International Engagement

- COP29 (Baku, Azerbaijan) Nov 2025.
- UN SB60 (Bonn, Germany) Jun 2024.
- COP28 (Dubai, UAE) Dec 2023.

Professional Membership

- Member of the Kurdistan Engineering Syndicate, Kurdistan Region
- Fellow, Advanced Higher Education Academy (FHEA).
- Member, Board of Environment, KRG.
- Member, University Lecturers of Kurdistan.
- Member, Fluid & Thermal Engineering Research Group, University of Nottingham

Skills

- Languages: Kurdish (native), English (fluent), Arabic (fluent).
- Software: MS Office (Word, Excel, PowerPoint, Visio).
- Technical: MATLAB (image & signal processing), LabVIEW; chemical process engineering; experimental methods.

Publications and Conference Proceedings

1. Abdullah, R. S., Mohammed, S. K., et al. (2026). Assessment of Greenhouse Gas Mitigation Options in Transport, Buildings, and AFOLU Sectors: A Case Study of the Kurdistan Region of Iraq. Manuscript under review, Environmental Development (Elsevier Editorial Manager). Submitted April 4, 2026; status: Under review.
2. Mohammed, S. K., Abdullah, R. S., Abdalqadir, M., & Aboelazayem, O. (submitted). Environmental Assessment of Nitrogen Dioxide Emissions from the Oil and Gas Industry Using Geoinformatics: A Case Study of Erbil, Kurdistan Region, Iraq. Remote Sensing Applications: Society and Environment.
3. Hasan, A.H., Mohammed, S.K., Hewakandamby, B., Saidj, F., Azzi, A. and Azzopardi, B.J., 2026. Frequencies, Velocities, and Spacing of Interfacial Waves of Falling Liquid Films in a Large Diameter Vertical Pipe. ChemEngineering, 10(3), p.32.

4. Mohammed, Shara K., Abbas H. Hasan, Georgios Dimitrakis, and Barry J. Azzopardi. "Small bubbles formation and contribution to the overall gas holdup in large diameter columns of very high viscosity oil." International Journal of Multiphase Flow 152 (2022): 104104.
5. Mohammed, Shara K., Abbas H. Hasan, Abubakr Ibrahim, and Georgios Dimitrakis. "An experimental study on the effect of gas injection configuration on flow characteristics in high viscosity oil columns." The Canadian Journal of Chemical Engineering (2021).
6. Hasan, A. H., Mohammed, Shara. K., Hewakandamby, B., & Azzopardi, B. (2021). Experimental study of the three-dimensional interfacial wave structure of freely falling liquid film in a vertical large pipe diameter. Chemical Engineering Research and Design, 169, 66-76.
7. Mohammed, Shara K., Abbas H. Hasan, Abubakr Ibrahim, Georgios Dimitrakis, and Barry J. Azzopardi. "Dynamics of flow transitions from bubbly to churn flow in high viscosity oils and large diameter columns." International Journal of Multiphase Flow 120 (2019): 103095.
8. Abbas H. Hasan, Shara K Mohammed, Laura Pioli, Buddhika N. Hewakandamby, Barry J. Azzopardi, Gas rising through a large diameter column of very viscous liquid: flow patterns and their dynamic characteristics, International Journal of Multiphase Flow, 116, 1-14.
9. Shara K Mohammed, A. Hasan, G. Dimitrakis, B. J. Azzopardi, 2018, Churn Flow in High Viscosity Oils and Large Diameter Columns. International Journal of Multiphase Flow 100, 16-29.
10. Shara K Mohammed, 2017. Gas-High Viscosity Oil Flow in Vertical Large Diameter Pipes. PhD, University of Nottingham.
11. Abbas H. Hasan, Barry J Azzopardi, Buddhika Hewakandamby, Shara K Mohammed, Yousuf A. Alaufi, An experimental study of a falling liquid film in a vertical pipe, 10th World Congress of Chemical Engineering. 2017 Barcelona, Spain.
12. Shara K Mohammed, A. Hasan, G. Dimitrakis, B. J. Azzopardi, Effects of air injection positions on the flow structure of high viscosity oil in a large diameter pipe, Proceedings of the 9th international conference on multiphase flow. 2016 Florance, Italy.
13. Hasan, B. Azzopardi, B. Hewakandamby, Y. AlAufi, N.J. Watson, Shara K Mohammed, Experimental characterization of interfacial wave structure of a falling liquid film in a vertical large pipe diameter, Proceedings of the 9th international conference on multiphase flow. 2016 Florance, Italy.
14. Shara K Mohammed (2012). Street and house Lighting Using Photovoltaic Panels, Lap Lambert Academic Publishing GmbH KG, Germany.

Conferences, Courses, and Workshops

1. Distinguished Speaker, Energy Transition Workshop: “Petroleum Engineering and Its Role in the Global Energy Transition”, College of Engineering, Knowledge University, organised with Palacký University Olomouc and the Society of Petroleum Engineers (SPE), 13 October 2025.
2. Petroleum Laboratory Instrumentation Training Course, Petroleum Technology Department, Erbil Polytechnic University, 22 February 2026; six-day practical training on petroleum laboratory equipment and instrumentation systems.

3. COP29, United Nations Framework Convention on Climate Change, Azerbaijan. Baku, Nov.2025.
4. Conference Participant, 1st International Conference on Industrial and Technology Innovations (ICITI 2025), Erbil Polytechnic University, 3–4 December 2025; attended and engaged in conference activities focused on industrial and technology innovation.
5. United Nations_SB 60, Bonn, Germany. June, 2024
6. COP28, United Nations Framework Convention on Climate Change, Dubai, United Arab Emirates, Dec.2023
7. Teaching and Learning Conference,“ Beyond Satisfaction, Student Engagement and Partnership in Teaching and Learning”, University of Nottingham, UK, Apr. 2023.
8. Teaching and Learning Development Program, University of Nottingham, UK, Sep. 2022.
9. Associate Teachers Programme, University of Nottingham, UK, Nov. 2020
10. Emergency First Aid at Work, University of Nottingham, UK, Jan. 2023.
11. Incident/Accident Investigation, University of Nottingham, UK, May 2022.
12. Interview Skills for Chair and Panel Members, University of Nottingham, UK, Aug. 2022.
13. Assessing and Giving Feedback, University of Nottingham, UK, 2020
14. Lecturing for Learning, University of Nottingham, UK, 2020s
15. Supporting Students Doing Undergraduate Projects and Dissertations, Jan. 2019.
16. Hazard Identification and Risk Control, University of Nottingham, UK, Feb. 2019
17. A Practical Look at Core Teaching Skills, University of Nottingham, UK, Apr. 2019
18. Personal Development Planning: Creating your own Personal Development Plan, University of Nottingham, UK, Apr. 2019
19. Inspirational Teaching, University of Nottingham, UK, 2019
20. Small Group Teaching, University of Nottingham, UK, 2019
21. Demonstrating in Laboratory Practicals, University of Nottingham, UK, Jan. 2018
22. Online Information Security, University of Nottingham, UK, July 2018
23. Diversity in Learning and Teaching, University of Nottingham, UK, Oct. 2018
24. Unconscious bias, Oct. 2018.
25. The 9th International conference of Multiphase flow, Florence, Italy, May 2016
26. Nuclear Energy” conference, Boston, United States, 2011.

References

- Dr. Georgios Dimitrakis, Associate professor of chemical engineering at the University of Nottingham, United Kingdom.
- Dr. Abbas H. Hasan, Lecturer, Faculty of Engineering, University of Hull, United Kingdom.