

# Dr Shara Kamal Mohammed,

BSc, MSc, PhD, FHEA

---

## 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

University of Kirkuk, Kirkuk, Iraq

- BSc in Fuel and Energy Engineering, Sep.1998-Jul. 2002

Erbil, Kurdistan Region



00447450559440



[Shara.mohammed@rpu.edu.iq](mailto:Shara.mohammed@rpu.edu.iq)



[shara.kamal@com.gov.krd](mailto:shara.kamal@com.gov.krd)



## Experience

**Sep 2024–now**

Full-time Head of Department • Department of Petroleum Technology •  
Erbil Technology College, Erbil Polytechnic University, Erbil, Kurdistan  
Region

**Aug 2023–now**

Part-Time Advisor (Climate Change) • Presidency of the Diwan of Council of  
Ministers-KRG

**July 2023–now**

Associate Researcher • Chemical and Environmental Engineering  
Department, The University of Nottingham, United Kingdom

**May 2022–Sep 2024**

Full-time lecturer • Department of Petroleum Technology • Erbil Technology  
College, Erbil Polytechnic University, Erbil, Kurdistan Region

**June 2023–now**

Academic Associate • Chemical and Environmental Engineering • The  
University of Nottingham, United Kingdom

**Nov. 2018–May 2022**

Research fellow • Chemical and Environmental Engineering • The University  
of Nottingham, United Kingdom

**Nov 2018–now**

Peer reviewer • Journal of Petroleum Science Technology, Chemical Engineering Communications, Journal of Advanced Research in Fluid Mechanics, Engineering Applications of Computational Fluid Mechanics. and Results in Engineering Journal

**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 visitor • 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 (high education) to the President of KRG Parliament • Kurdistan Parliament, Kurdistan Region

**July 2007–May 2009**

Part-time • Adviser (high education) to the Vice President of KRG Parliament • Kurdistan Parliament, Kurdistan Region

**April 2004–Oct. 2006**

Part-time lecturer • Mechanical Department • Technical Institute, Kirkuk

Part-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

## **Teaching Experience**

I have started teaching since I received my undergraduate degree, BSc in Fuel and energy engineering, in 2002. I taught Mechanical engineering and Mechanical and engineering drawing. Then I decided to advance my career in teaching in high education by pursuing graduate-level teaching qualifications for higher education. After getting a master's degree in Mechanical engineering\thermal power (2009), I continued working as an assistant lecturer. I taught Fluid mechanics and Heat transfer modules to second-year undergraduate students. The teaching included both theoretical classes and laboratory practicals. I have also supervised undergraduate students in their final year graduation projects along with teaching. Later, I started a PhD in Chemical Engineering at the University of Nottingham. While studying, I continued teaching as a demonstrator for the third-year chemical engineering laboratory, supporting various experiments and unit operations. I also have participated in showcasing large-scale experimental facilities for the chemical engineering department during outreach and open days. Upon graduation, I continued teaching as a Lecturer at Erbil Polytechnic University. Teaching final year undergraduate students Oil and Gas technology module. I was awarded Associate Fellow in the Higher Education Academy in the UK in recognition

of attainment against the UK Professional Standards Framework for Teaching and Learning Support in higher education on 13/11/2020. Then in July 2022, I became a fellow in the Advanced Higher Education Academy on the basis that my submission demonstrates practice that aligns with Descriptor 2 of the UK Professional Standards Framework.

### **Research Experience**

My PhD research studied the characteristics of gas flow through large diameter columns with very high viscosity oils. I have used two large-scale columns of 240 and 290 mm in diameter and about 10 m in height and compared the results. I have applied high spatial and temporal resolution tomography techniques, including Electrical capacitance tomography and high-speed imaging. My PhD resulted in very impactful findings on the Multiphase flow, especially high viscosity flows. I have introduced the presence of Churn flow in viscous liquids for the first time in literature. I published my new finding in the international journal of multiphase flow in 2018. The paper explains the characteristics of the hydrodynamics of churn flow in high-viscosity oil and large-diameter columns. I published six papers in high-impact factors journals in five years in the same field besides three conference papers in addition to a book on Photovoltaic systems. Besides my project on high-viscosity oils, I have commissioned a new sensor manufactured by HZDR for the University of Nottingham. I have calibrated the (Multiple Probe Film Sensor, MPFS) and designed a rig (falling film rig) for the new sensor. The new sensor aims to measure the characteristics of falling film in large-diameter columns. I have lately published the results from the new sensor in the Chemical Engineering Research and Design Journal. Besides, I am a member of Fluid and Thermal Engineering Research Group/ University of Nottingham. In addition, I work as a volunteer reviewer in several journals in my field, such as the Journal of Petroleum Science and Technology, the Journal of Advanced Research in Fluid Mechanics, Engineering Applications of Computational Fluid Mechanics, and Chemical Engineering Communications.

I also have experience in designing Photovoltaic systems to generate electricity from solar power. This was my master's project at the College of Engineering, Salahaddin University.

### **Management and Leadership Experience**

As a part-time job, I have been working as a representative of the vice president and the president of parliament for the higher education section in the Parliament of Kurdistan for five years. My job was based on managing, directing and supporting the higher education sector in collaboration with the Ministry of Higher Education. I led a number of programmes that provided scholarships for undergraduate and postgraduate students to study at local and international universities. Besides, I have also worked in providing and supporting university staff to get the essential training courses for professional development. As part of my role at The University of Nottingham, I lead the laboratory sessions and train/teach the demonstrators who supervise the undergraduate students. I also managed to establish a collaboration with the University of Hull, Chemical Engineering Department.

### **Personal Skills and Competence**

- Languages: Kurdish (Mother Tongue), English (Fluent), Arabic (Fluent)
- Teaching experience, Crude oil Refinery, Petroleum Industrial Equipment,

Oil and Gas technology, Heat transfer, Fluid Mechanics, Applied Mechanics and Engineering and mechanical drawing subjects for seven years in the Erbil Polytechnic University, Kurdistan Region

- Demonstrator, supervising experiments on Evaporative Crystallisation and Distillation for two years in the Chemical Engineering Laboratory for year three at The University of Nottingham.
- Teaching Practicals in the Chemical Engineering Laboratories at The University of Nottingham.
- Design and generate chemical engineering practical teaching materials.
- Modify and commission new rigs/experiments in the chemical engineering laboratories.
- Student ambassador, Chemical and Environmental Engineering Department (Participated in open days showcasing my research to prospective students) at the University of Nottingham.
- Supervision: supervising students for the graduation projects in Erbil Polytechnic University, Kurdistan Region.
- Presenting in the 9th International Conference of Multiphase Flow in (May 2016) in Florence, Italy. Also attending the “Nuclear Energy” conference in (2011) in Boston, US.
- Leadership, leading a non-governmental organisation for undergraduate students (2004-2007) in Kirkuk, Iraq.
- Founder of a civil independence organisation for the free youth (2007-2011) in Kirkuk, Iraq.
- Resident tutor at 18th Shubat Hall (2008-2009) in Erbil, Kurdistan Region.
- I also have experience designing photovoltaic systems to generate power from solar energy.

### **Additional Skills**

- Image processing using Matlab
- Signal processing using Matlab, LabVIEW
- Two-phase flow tomography (ECT, WMS, and MPFS),
- Chemical process engineering.
- Photovoltaic system power plants design.
- Competent user of Microsoft packages including Visio, PowerPoint, Word and Excel.

### **Professional Memberships**

- Member of the University Lecturers of Kurdistan, Kurdistan Region.
- Member of the Engineering Union of Kurdistan, Kurdistan Region
- Fellow of the Advanced Higher Education Academy in the UK, FHEA
- Member of Fluid and Thermal Engineering Research Group/ University of Nottingham, UK
- Member of the Board of Environment-KRG

### **Committees Memberships**

- Head of “The Committee of Flood Mapping and Management Project in Kurdistan” EPU & IOM
- Head of “Toward placing Kurdistan on the global green map” committee EPU
- Member of the coordination committee of “Climate Investment Plan”

KRG-UNDP

- Member of “Local Appropriate Mitigation Plan Committee” KRG-UNDP
- Member of “Biannual Transparency Report” Committee KRG-UNDP

### Publications and Conference Proceedings

1. **Mohammed, Shara K.**, Abbas H. Hasan, Georgios Dimitrakakis, 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.
2. **Mohammed, Shara K.**, Abbas H. Hasan, Abubakr Ibrahim, and Georgios Dimitrakakis. "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).
3. 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.
4. **Mohammed, Shara K.**, Abbas H. Hasan, Abubakr Ibrahim, Georgios Dimitrakakis, 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.
5. 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.
6. **Shara K Mohammed**, A. Hasan, G. Dimitrakakis, B. J. Azzopardi, 2018, Churn Flow in High Viscosity Oils and Large Diameter Columns. *International Journal of Multiphase Flow* 100, 16-29.
7. **Shara K Mohammed**, 2017. Gas-High Viscosity Oil Flow in Vertical Large Diameter Pipes. PhD, University of Nottingham.
8. 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.
9. **Shara K Mohammed**, A. Hasan, G. Dimitrakakis, B. J. Azzopardi, Effects of air injection positions on the flow structure of high viscosity oil in a large diameter pipe, *Proceedings of the 9<sup>th</sup> international conference on multiphase flow*. 2016 Florence, Italy.
10. A. 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 9<sup>th</sup> international conference on multiphase flow*. 2016 Florence, Italy.
11. **Shara K Mohammed** (2012). Street and house Lighting Using Photovoltaic Panels, *Lap Lambert Academic Publishing GmbH KG*, Germany.

### Conferences, Courses, and workshops

1. COP29, United Nations Framework Convention on Climate Change, Azerbaijan. Baku, Nov.2025.
2. United Nations\_SB 60, Bonn, Germany. June, 2024
3. COP28, United Nations Framework Convention on Climate Change, Dubai, United Arab Emirates, Dec.2023
4. Teaching and Learning Conference, “ Beyond Satisfaction, Student Engagement and Partnership in Teaching and Learning”, University of Nottingham, UK, Apr. 2023.
5. Teaching and Learning Development Program, University of Nottingham, UK, Sep. 2022.
6. Associate Teachers Programme, University of Nottingham, UK, Nov. 2020
7. Emergency First Aid at Work, University of Nottingham, UK, Jan. 2023.
8. Incident/Accident Investigation, University of Nottingham, UK, May 2022.
9. Interview Skills for Chair and Panel Members, University of Nottingham, UK, Aug. 2022.
10. Assessing and Giving Feedback, University of Nottingham, UK, 2020
11. Lecturing for Learning, University of Nottingham, UK, 2020s
12. Supporting Students Doing Undergraduate Projects and Dissertations, Jan. 2019.
13. Hazard Identification and Risk Control, University of Nottingham, UK, Feb. 2019
14. A Practical Look at Core Teaching Skills, University of Nottingham, UK, Apr. 2019
15. Personal Development Planning: Creating your own Personal Development Plan, University of Nottingham, UK, Apr. 2019
16. Inspirational Teaching, University of Nottingham, UK, 2019
17. Small Group Teaching, University of Nottingham, UK, 2019
18. Demonstrating in Laboratory Practicals, University of Nottingham, UK, Jan. 2018
19. Online Information Security, University of Nottingham, UK, July 2018
20. Diversity in Learning and Teaching, University of Nottingham, UK, Oct. 2018
21. Unconscious bias, Oct. 2018.
22. The 9th International conference of Multiphase flow, Florence, Italy, May 2016
23. “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
- Dr Omed Sabah Othman, Professor in Privet Law, President of the Dewan, Council of Ministers, KRG