

Shara Kamal Mohammed, BSc, MSc, PhD, FHEA

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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 higher 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 have also 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. I taught final-year undergraduate students the oil and gas technology module, Petroleum Refining, Petroleum Industrial Equipment, Heat and Mass Transfer, and Fluid Mechanics. 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 gas flow characteristics 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 findings 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 the same field in five years, in addition to three conference papers and 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. Recently, I published the results of the new sensor in the Chemical Engineering Research and Design Journal. I am also a Fluid and Thermal Engineering Research Group/ University of Nottingham member. 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.

Academic Qualifications

Sep. 2012 –Jul 2017	Full time postgraduate student The University of Nottingham, United Kingdom Thesis title: <i>Gas-High Viscosity Oil Flow in Vertical Large Diameter Pipes</i>	PhD in Chemical and Environmental Engineering
Oct. 2006-Sep.2009	Full time postgraduate student College of Engineering, Salahaddin University, Kurdistan Regional Government-Iraq Thesis title: <i>Street and House Lighting Using Photovoltaic Panels</i>	MSc in Mechanical Engineering/ Thermal Power
Sep.1998-Jul. 2002	Full time undergraduate student Fuel and Energy Engineering, University of Kirkuk, Iraq	BSc in Fuel and Energy Engineering

Work Experience

Aug 2023-now	Part-Time Advisor Presidency of the Diwan of Council of Ministers-KRG	Climate Change
July 2023-now	Associate Researcher Chemical and Environmental Engineering Department, The University of Nottingham, United Kingdom	Research
May 2022 - now	Full-time Lecturer Department of Petroleum Technology, Erbil Technology College, Kurdistan Regional Government-Iraq	Teaching 1st and 2nd year, Petroleum refining, Petroleum Industrial Equipment, Heat and Mass Transfer, and Fluid Mechanics.
Nov. 2018 –May. 2022	Research fellow Chemical and Environmental Engineering Department, The University of Nottingham, United Kingdom	Research
Nov. 2018 –now	volunteer reviewer Journal of Petroleum Science Technology, Chemical Engineering Communications, Journal of Advanced Research in Fluid Mechanics, Engineering Applications of Computational Fluid Mechanics. Results in Engineering Journal	
July. 2017- Nov. 2018	Full-time Lecturer Department of Petroleum Technology, The Institute of Technology, Kurdistan Regional Government-Iraq	Teaching 2nd year students\ Oil and gas technology
July. 2017- Nov. 2018	Academic Visitor Chemical Engineering department, The University of Nottingham, United Kingdom	Research

Sep.2009-Aug. 2011	Full time lecturer Cooling and refrigerating Equipment Department, The Institute of Technology, Kurdistan Regional Government-Iraq	Teaching 1st and 2nd year students / Fluid Mechanics, Heat Transfer
April 2004- Oct. 2006	Part time lecturer Mechanical Department, Technical Institute, Kirkuk	Teaching 2nd year students, Mechanical Engineering, Engineering and Mechanical Drawing
	Part time project managements Engineering Projects Unit, The Institute of Technology/Erbil, Kurdistan Regional Government-Iraq	Engineering project manager
Sep. 2002- April 2004	Part time lecturer Mechanical Department, Technical Institute, Kirkuk	Teaching 2nd year students, Engineering and mechanical drawing

Publications and Conference Proceedings

1. **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.
2. **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).
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 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.
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. Dimitrakis, 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.

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9. **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 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 9th 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.
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Personal Skills and Competence

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1. Languages: Kurdish (Mother Tongue), English (Fluent), Arabic (Fluent)
 2. Teaching experience, Oil and Gas technology, teaching Heat transfer, Fluid mechanic, Applied mechanics and Engineering and mechanical drawing subjects for 7 years in the Erbil Polytechnic University, Kurdistan Regional Government-Iraq.
 3. Demonstrator, supervising experiments on Evaporative Crystallisation and Distillation for 2 years in the Chemical Engineering Laboratory for year 3 at The University of Nottingham.
 4. Teaching Practicals in the Chemical Engineering Laboratories at The University of Nottingham.
 5. Design and generate chemical engineering practical teaching materials.
 6. Modify and commission new rigs/experiments in the chemical engineering laboratories.
 7. Student ambassador, Chemical and Environmental Engineering Department (Participated in open days showcasing my research to prospective students) at the University of Nottingham.
 8. Supervision: supervising students for the graduation projects in Erbil Polytechnic University, Kurdistan Regional Government-Iraq.
 9. Presenting in the 9th International conference of Multiphase flow in (May 2016) in Florence, Italy. Also attending "Nuclear Energy" conference in (2011) in Boston, US.
 10. Leadership, leading a non-governmental organization for the undergraduate students (2004-2007) in Kirkuk, Iraq.
 11. Founder of a civil independence organization for the free youth (2007-2011) in Kirkuk,
 12. Iraq.
 13. Resident tutor at 18th Shubat Hall (2008-2009) in Erbil, Kurdistan Regional Government.
 14. I also have experience in designing photovoltaic systems to generate power from solar energy.
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Conferences, Courses, and workshops

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

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

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1. Member of the University Lecturers of Kurdistan, Kurdistan Regional Government-Iraq.
 2. Member of the Engineering Union of Kurdistan, Kurdistan Regional Government-Iraq.
 3. Fellow of the Advanced Higher Education Academy in the UK, FHEA
 4. Member of the Board of Environment-KRG
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References

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1. Dr. Georgios Dimitrakis, Associated professor of chemical engineering, The University of Nottingham, United Kingdom.
 2. Dr. Abbas H. Hasan, Lecturer, Faculty of Engineering, University of Hull, United Kingdom
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