

Laila Abdulla Eisa Al-Khatib
Associate Professor in Environmental Engineering

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Research gate: [https://www.researchgate.net/profile/Laila Alkhatib](https://www.researchgate.net/profile/Laila_Alkhathib)

EDUCATION:

PhD in Engineering

Faculty of Engineering, The University of Nottingham, UK 2006

Integrated PhD (Combined Master Diploma in PhD program)

Thesis Title (*Development of (Bio)Fouling Resistant Membrane for Water Treatment Applications*)

BSc in Chemical Engineering

Department of Chemical Engineering, Mu'tah University, Jordan 1998

General Secondary Certificate, Scientific Branch, Jordan 1994

PROFESSIONAL APPOINTMENTS/EMPLOYMENT:

- Head of Environmental Engineering Department 2024 – now
- Associate Professor, Al-Hussein Bin Talal University (AHU), 2018 - now.
- Associate Professor, Department of Forensic Chemistry, College of Forensic Sciences, Naif Arab University for Security Sciences, 2015 – 2018.
- Associate Professor, Al-Hussein Bin Talal University (AHU), 2012 - 2015.
- Assistance Professor, AHU 2006 – 2012.
- Head of Chemical Engineering Department 2007 – 2009.
- PhD Researcher, Faculty of Engineering, University of Nottingham, UK, 2001 – 2006.
- Chemical Engineering training, Arab Pharmaceutical Industries Co. Al-Salt - Jordan 1998.

AWARDS AND HONORS:

- Prize for excellent PhD Thesis at the University of Nottingham-2006 Obtained first instructor level.
- Best of Papers Prize during the 8th International Conference in Modeling and Simulation, Petra – Jordan, 18 – 20 Nov. 2008, and published in Proceedings ISBN 978-9957-8643-0-9.
- IChemE prize for excellent presentation skills in workshop entitled, “Fluid separations research event” -2005.
- Award of Attendee Course organized by MDRC in Jordan, Course title: Seawater Desalination and the Environment; Impact of brine and chemical Discharge on the

Marine Environment, 1-3 December 2008, Amman, Jordan. Speakers: Prof. Thomas Hopner, Dr. Tobais Bleninger, and Eng. Sabine Lattemann (Germany).

- Winning PhD scholarship in Engineering, 2001, Study place: University of Nottingham – UK, Support from Al-Hussein Bin Talal University.
- First place in Engineering Graduation Projects Supervision Prize, Conducted by Jordanian Association of Engineers – 2010.
- Winning B.Sc. Scholarship in Chemical Engineering, 1994, Study place: Mu'tah University – Jordan, Support from Jordanian Ministry of Higher Education & Scientific Research.
- Establishment of Chemical Engineering Department in Al-Hussein Bin Talal University. Including setting study plan, course catalog, lab preparation, and accreditation etc.
- Establishment of Environmental Engineering Department in Al-Hussein Bin Talal University. Including setting study plan, course catalog, lab preparation, and accreditation etc.

PUBLICATIONS:

Book:

Al-Khatib, Laila Abdullah, 2018, Security and Safety Management in Laboratories, Naif University Publishing House, Riyadh. ISBN 9786038235058.

Ahmad, A.A., Alwahbi, A., **Khatib, L.A.A.**, Dammag, H., 2024. Biomass-Based Activated Carbon, in: From Biomass to Biobased Products. IntechOpen.

Journal Papers:

Al-Khatib, L.A.; AlHanaktah, A.M. Wastewater Treatment Plant Upgrade and Its Interlinkages with the Sustainable Development Goals. Resources 2025, 14, 62. <https://doi.org/10.3390/resources14040062>

Al-Khatib, L.A.; Fraige, F.Y. The Potential Material Flow of WEEE in a Data-Constrained Environment—The Case of Jordan. Recycling 2024, 9, 4. <https://doi.org/10.3390/recycling9010004>

Laila A. Al-Khatib, Ahmed M. AlHanaktah, and Feras Y. Fraige, "Ecological and Human Health Risk Assessment of Heavy Metals in Municipal Sewage Sludge for Land Application," International Journal of Environmental Science and Development vol. 15, no. 5, pp. 277-287, 2024.

Alma'asfa, S. I., Fraige, F. Y., Abdul Aziz, M. S., Khor, C. Y., & **Al-Khatib, L. A.** (2024). Evaluating the performance of the Anwaralardh photovoltaic power generation plant in Jordan: Comparative analysis using artificial neural networks and multiple linear regression

- modeling. International Journal of Renewable Energy Development, 13(4), 608-617.
<https://doi.org/10.61435/ijred.2024.60156>
- Hala Alrawashdeh, **Laila A. Al-Khatib** and Bassam Abed, 2025. Aging Aircraft and Emissions: Machine Learning Predictions in Takeoff and Landing Operations. Nature Environment and Pollution Technology, 24(3), D1743.
<https://doi.org/10.46488/NEPT.2025.v24i03.D1743>
- Fraige, F.Y.; **Al-Khatib, L.A.**; Al-Shaweesh, M.A. Predicting WEEE Generation Rates in Jordan Using Population Balance Model. Sustainability 2023, 15, 2845.
<https://doi.org/10.3390/su15032845>
- Titi, A. H., Al Rawashdeh, R., Fraige, F., Dweirj, M., & **Al-khatib, L. A.** (2025). Evaluation of Different In-Pit Haulage Patterns in an Oil Shale Mine Deposit. Journal of Mines, Metals and Fuels, 73(3), 589–605. <https://doi.org/10.18311/jmmf/2025/45979>
- Hani M. Alnawafleh, Feras Y. Fraige, Khalid E. Tarawneh, Ibrahim A. Sarairah, **Laila A. Al-Khatib**, Fractional Yield, Extract Composition and Variability from Jordanian Oil Shales, Journal of Analytical Sciences, Methods and Instrumentation, 2016, 6, 51-63
- Hani Muhaisen Alnawafleh, Feras Younis Fraige, **Laila Abdullah Al-khatib**, Mohammad Khaleel Dweirj. Jordanian Oil Shales: Variability, Processing Technologies, and Utilization Options. Journal of Energy and Natural Resources. Vol. 4, No. 4, 2015, pp. 52-55.
- Mohammad Al-Hwaiti , Omar Al-Khashman , **Laila Al-Khateeb** , Feras Freig, Radiological hazard assessment for building materials incorporating phosphogypsum made using Eshidiya mine rock in Jordan, Environ Earth Sci, DOI 10.1007/s12665-013-2629-z,
- Omar Ali Al-Khashman, Mohammed Al-Hwaiti, **Laila Al-Khatib**, and Feras Fraige, 2013, Assessment and evaluation of treated municipal wastewater quality for irrigation purposes, Research Journal of Environmental and Earth Sciences. 5(5): 229-236, 2013, ISSN: 2041-0484; e-ISSN: 2041-0492.
- Al-Khatib, L.A.**, Fraige, F.Y., Mohammad Al-Hwaiti, and Omar Al-Khashman, 2012, Adsorption of Methylene Blue From Aqueous Solution by Natural and Acid Activated Bentonite, American Journal of Environmental Sciences, 8, 510 - 522.
- Fraige, F.Y., **Al-Khatib, L.A.**, Dweirj, M.K., Alnawafleh, H.M., Langston, P.A., 2012, Waste Electric and Electronic Equipment in Jordan – Willingness and Generation Rates, 2012, Journal of Environmental Planning and Management, 55, 2, 2012, 161 – 175.
- Fraige, F.Y., Langston, P.A., and **Al-Khatib, L.A.**, 2011, Polyhedral particles hopper flowrate predictions using Discrete Element Method, Chemical Product and Process Modeling, 6, 1, article 31, 1 – 32.
- Al-Khatib, L.A.**, Fraige, F.Y., Assessment of Wastewater Treatment Plants Performance and Reuse opportunities, 2011, International Journal of Science and Technology, 6, 2, 2011.
- Al-Zoubi, H, Thyabat, S, **Alkhatib, L**, 2009, A hybrid Mlotation–membrane process for wastewater treatment: an overview, Desalination and Water Treatment 7, 60 – 70 .

- V. M. Kochkodan, N. Hilal, V. V. Goncharuk, **L. Al-khatib** and T. Levadna, 2006, Effect of surface modification of polymeric membranes on their tendency to (bio)fouling, *Journal of Colloid* 68, 26 – 33.
- N. Hilal, W. R. Bowen, **L. Al-khatib** and O.Ogunbiyi, 2006, A review of atomic force microscopy applied to cell interactions to membranes, *Chemical Engineering Research and Design*, 84, pp 282 – 292.
- Al-khatib, L. A.** (2006). Development of (Bio)Fouling Resistant Membrane for Water Treatment Applications. PhD. Thesis. Nottingham University.
- N. Hilal, V. Kochkodan, R. Nigmatullin, V.Gancharuk, **L.Al-khatib**, 2005, Lipaseimmobilized biocatalytic membranes for enzymatic esterification: comparison of various approaches to membranes preparation, *Journal of Membrane Science* 268, 198 – 207.
- N.Hilal, **L.Al-khatib**, R. Nigmatullin, H. Al-Zoubi, 2005, Atomic force microscopy study of membranes modified by surface grafting of cationic polyelectrolyte. *Desalination* 184, 45 – 55.
- N. Hilal, **L.Al-Khatib**, V. Kochkodan and Tetyana Levadna, 2004, Surface modified polymeric membranes to reduce (bio)fouling: A microbiological study using E.coli , *J. Desalination* 167, 293 – 300.
- N. Hilal, **L.Al-Khatib**, B. P. Atkin, V. Kochkodan and N. Potapchenko, 2003, Photochemical modification of membrane surfaces for a (bio)fouling reduction: a nano-scale study using AFM, *J. Desalination* 158, 65 – 72.
- N. Hilal, V. Kochkodan, **L. Al-Khatib** and G. Busca, 2002, Characterization of molecularly imprinted composite membranes using an atomic force microscopy, *Journal of Surface and Interface Analysis*. 33, 672 – 675.

CONFERENCE ACTIVITY/PARTICIPATION:

- 1st GJU Symposium on Sustainable Development 2022 Water, Energy and Environment German-Jordanian/MENA Cooperation
- The 2nd International Jordanian Forum for Occupational Health and Safety (IJFOHS2), 2021.
- 2nd Saudi International Conference of Forensic Medicine and Sciences, Riyadh 5-8 March 2017.
- The thirty-eighth scientific meeting (Use of Nanotechnology in Water Treatment) in KACST, held 17 Apr 2016.
- Organizing Member of the 2nd International Arab Forensic Sciences and Forensic Medicine Conference held in Riyadh – KSA, 8 – 10 Nov. 2015.
- Member of Organizing Committee of the 8th International Conference in Modeling and Simulation held in Petra – Jordan, 18 – 20 Nov. 2008.
- Al-Khatib, L.A** (Speaker), IChemE Fluid Separation Processes, Subject Group (FSPG) at BP Sunbury, London –UK, on 26 May 2005.

- Fraige, F.Y., AlNawafleh, H.M., **Al-Khatib, L.A.**, 2012, Solvent Extraction of Jordanian Oil Shale, Kinetics and Thermodynamic Study, 32nd Oil Shale Symposium, Golden - Colorado, USA, 15 – 19 Oct 2012.
- Fraige, F.Y., **Al-Khatib, L.A.**, AlNawafleh, H.M., Dweirj, M.K., Al-Hwaiti, M., and Al- Khashman, O., 2012, Separation of Shredded E-waste Using Vibration, 4th e-Health and Environment Conference in the Middle East (Oral Presentation), held at the Atlantis Hotel, Dubai Palm, UAE, during 30th January – 2 February, 2012.
- Fraige, F.Y., **Al-Khatib, L.A.**, AlNawaMleh, H.M., Dweirj, M.K., 2011, E-waste Separation using mechanical vibration, the Sixth Jordanian International Mining Conference (Oral Presentation), held in Amman during 1 – 3 Nov. 2011.
- Fraige, F.Y., AlNawafleh, H.M., Dweirj, M.K., Al-Khatib, L.A., 2011, Solvation Variability of Jordanian Oil Shales, Colorado – USA, accepted paper in 31st Oil Shale Symposium, USA.
- Fraige, F.Y., **Al-Khatib, L.A.**, Dweirj, M.K., AlNawaMleh, H.M., Langston, P.A., 2009, E-waste Assessment in the Arab Region, 4th International Environmental Conference (Oral Presentation), held in AlMansura University, Egypt during 28 – 29 October 2009.
- Fraige, F.Y., AlNawafleh, H.M., Dweirj, M.K., **Al-Khatib, L.A.**, 2008, Variability of Jordanian Oil Shale, 28th Oil Shale Symposium, Colorado – USA, 13 – 15 Oct 2008.
- Fraige, F.Y., Langston, P.A, and **Al-Khatib, L.A**, 2008, Development of Distinct Element Method for modeling Non-spherical Particles, presented at the 8th International Conference in Modeling and Simulation held in Petra – Jordan, 18 – 20 Nov. 2008. ISBN 978-9957-8643-0-9.
- Fraige, F.Y., Langston, and **AL-Khatib, L.A.**, 2007, Applications of Distinct element simulation for granular material, (presentation paper) in the Fifth Jordanian International Mining Conference held in Amman Sep. 2007.

GRANTS AND PROJECTS:

- Development of Fouling Resistant Membrane for Application in Water Treatment, Funder: Scientific Research Fund, Ministry of Higher Education, Jordan 2009-2013. Prime Investigator, Field: Chemical Modification and Water Treatment by Membrane and Nano-technology, Fund \$ 115,000.
- Developing a Solid-Solid Recycling System to Recover Valuable Materials from Electric and Electronic Waste (e-waste) Using Vibration Funder: Scientific Research Fund, Ministry of Higher Education, Jordan 2008-2013. Co-Investigator, Field: Mechanics and Particle Technology, Fund \$60,000.
- Phenols and Dyes Removal using Natural Materials (Adsorption), Funder: King Abdullah II Design and Development Bureau (KADDB), Jordan (1 year). Prime Investigator, Field: Chemical Modification and Water Treatment by Adsorption Process, Fund \$ 6980
- Total Fund: \$181,980.**

SUPERVISION MASTER'S THESIS:

Assessment Of Noise and Emissions from Aging Aircraft at Queen Alia International Airport (QAIA) Using Machine Learning Method- Hala Alrawashdeh.

Toward A Sustainable Solution For WEEE In Jordan- Ahmad AL-Aqabawi.

Occupational Accidents in Jordan: Their Causes, Consequences and Prevention Methods- Murad AL-Rawashdeh.

Toward Sustainable Utilization of Sewage Sludge in Jordan- Ahmed AlHanaktah.

Knowledge, Attitude, and Practice Toward Medical Waste Disposal Among Health Workers in Aqaba Health Directorate- Maram Barakt.

Extraction of Cocaine and its metabolites using microwave technology and its analysis by GC-MS- Dalal Al-Asimi.

Determination of cocaine and its metabolites in urine using Gas Chromatography Coupled with Mass Spectrometry (GC-MS)- Abeer Al-Tamra.

Assessment of Heavy Metals in Some Cosmetics Available in Saudi Arabia Local Markets Using Neutron Activation Analysis _Aisha AL-Hawsawi.

RESEARCH EXPERIENCE and INTEREST:**- Chemical and Physical Modification of Polymer Membranes (Nanotechnology)**

Methodological approaches for the development of new membranes based on chemical modification of commercially available membranes and membrane coating using polymers with the ability to reduce fouling and (bio)fouling potential. This will include binding of biocides to the membrane surface and membrane coating with new copolymers with potential bactericide activity.

- Membrane technology

This includes membrane characterization, performance study, chemical and physical membrane modification, and application in different water and wastewater treatment. In addition, membrane application in seawater desalination. Membrane filtration operation using both dead-end and crossflow systems.

- Water and wastewater treatment/ Wastewater reuse

This includes treatment of wastewater for reuse purposes, Characterization of wastewater and treatment plants' efficiency, and Membrane technology as a nonconventional treatment method. Sharing in the project for treating the water resulting from the Jordanian phosphate

flotation units. Utilization of different natural materials and agro-waste for wastewater treatment using adsorption and coagulation.

- Waste Valorization

Focus on developing sustainable approaches for resource recovery and pollution mitigation, particularly interested in exploring the potential of plant waste as a source of coagulants and adsorbents for water and wastewater treatment, which offers eco-friendly alternatives to conventional methods. Additionally, investigating the utilization of sludge as a valuable fertilizer, transforming this byproduct into a beneficial resource for agriculture. Also, the production and application of biomass-based activated carbon, converting waste biomass into a high-value material for various environmental applications, including water purification and pollutant removal.

- Engineering Applications of Atomic Force Microscopy

This includes a full characterization of initial and modified membranes using atomic force microscopy (AFM), which provides membrane surface topography images. Full analysis of the membrane surface to obtain the key parameters of the membranes that affect their performance, such as membrane roughness, pore size, and pore size distribution.

Also, preparation and modification of colloidal probes and study the intermolecular interaction forces between the membrane surface and major foulants in wastewater streams, and evaluation membrane tendency for fouling.

- Desalination

Evaluation of the performance of different types of membranes in terms of their salt rejection, trans-membrane flux, and their stability using synthetic saline water of different compositions and samples from the Red Sea. Also study fouling tendency of different membranes and developing strategies for the preparation of fouling resistant membranes and study water desalination and softening by low-fouling RO/NF systems.

- Waste Management, Separation, and Modeling:

The management of electronic waste (e-waste) in Jordan and Arab Countries. Sharing in the investigation of developing management and legal systems for e-waste applicable to the country and neighboring countries. Also, developing a more sound technique to recycle e-waste using mechanical vibration is considered.

Moreover, focus on enhancing the efficacy and sustainability of medical waste management systems. Also, optimizing waste segregation and collection processes within healthcare facilities. In addition, exploring the development of training programs and educational interventions to improve medical waste handling practices among healthcare workers, and studying the potential impact of their Knowledge, Attitude, and Practice Toward Medical Waste Disposal.

- Safety and Security Management in Laboratories

- Ecological and Human Health Risk Assessment

- **Analytical Method Development (extraction, derivatization, and estimation using gas chromatography) for drug and toxin**
- **Microwave application in drug and toxin extraction and derivatization**
- **Mineral processing**

This includes the processing of Jordanian oil shale. More efficient and environmentally friendly techniques for oil shale processing are under investigation.

TRAINING COURSES DELIVERED:

- Training course for Chemistry department female students from King Saud University in advanced instrumental analysis and applications (GC, AAS, Hplc,UV). 25/11/1436 to 29/12/1436
- Training course for Chemistry department female students from King Saud University in advanced instrumental analysis and applications. 22/4/1437 to 14/5/1437
- Training course for Chemistry department female students from King Saud University in advanced instrumental analysis and applications. 24/5/1438 to 15/6/1438
- Training course for Chemistry department female students from King Saud University in advanced instrumental analysis and applications. 12/1/1439 to 3/2/1439
- Training course for Chemistry department female students from Prince Sattam Bin Abdulaziz University in advanced instrumental analysis and applications.
- Training tour for Physics department female students from King Saud University in Forensic Sciences College and its area of expertise.
- Participation in the special training course: Prison Works, 28/12/1436- 27/3/1437

SERVICE TO PROFESSION:

Reviewer for many journals in Engineering, such as Jordan Journal of Earth and Environmental Sciences, and Environment Protection Engineering Journal.

Reviewer in many supporting research bodies, such as the Abdul Hameed Shoman Foundation and the Center for Studies and Research at Naif Arab University for Security Sciences.

And Reviewer for the 8th International Conference in Modeling and Simulation held in Petra – Jordan, 18 – 20 Nov. 2008.

DEPARTMENTAL/UNIVERSITY SERVICE:

- Member of AHU University Council
- Faculty of Engineering Council Member
- Head of Chemical Engineering Department

- Head of Environmental Engineering Department
- Chemical Engineering Department Council Member
- Environmental Engineering Department Council Member
- Engineering Training Committee Member
- Accreditation Committee Member
- Solar Energy Committee Member
- Student Affairs Council Member
- Organizing Committee Member of the 8th International Conference in Modeling and Simulation (Jordan, 18 – 20 Nov. 2008)
- Member of Student Infractions Panel.
- Member of the Scientific Research Committee in the Faculty of Engineering
- Member of the setting and studying tenders Committee
- Studying tenders Committee Member
- And many other committees.
- Participating in many committees in the Department of Forensic Chemistry / Faculty of Forensic Science-KSA.

WORKSHOP/COURSES ATTENDED:

Environmental Impact Assessment of Development Projects, Water and Environment Committee, Jordan Engineering Association, 2025.

Academic Program and Course Building and Description Workshop- conducted by Education Evaluation Commission – National Centre for Academic Accreditation and Evaluation (EEC-NCAAA) 13-14/12/2017

Seawater Desalination and the Environment; Impact of brine and chemical Discharge on the Marine Environment 1-3/12/2008.

Writing Successful Fellowship Application, Nature of the PhD and the supervision Process, An Introduction to creating and Publishing Web page, Demonstrating and Assessment, How to prepare an effective Poster Presentation, Excel Intermediate, Excel Advanced, Skills of Spoken and Written Communication, Word for Long Documents, Object Oriented Programming, Computer Skills and Programming, Parallel Programming, FP7 project writing.

TEACHING EXPERIENCE:

BSC. Courses:

- Water and Wastewater Treatment
- Water and Wastewater Treatment Lab
- Introduction to Environmental Engineering
- Environmental legislations
- Environmental Biology and Biotechnology
- Safety Engineering

- Toxicology
- Physical Chemistry
- Thermodynamic 1
- Environmental Chemistry
- Thermodynamic 2
- Environmental Chemistry lab
- Thermodynamics lab
- Water quality Engineering & supply,
- Fluid Mechanics lab
- Introduction to Engineering
- Graduation Projects
- Engineering Workshop 1

MSC. Courses:

- Advanced Safety Engineering Management
- Operations Research Management
- Quality Laboratory,
- Practical Analytical Toxicology 2
- Chromatography
- Analytical toxicology
- Advanced Instrumental Analysis.
- Mass spectrometry

LANGUAGES/ SKILLS:

Arabic: native speaker.

English: Excellent in Speaking, Reading, and Writing.

Computer Use (Expert)

Last updated: 17/4/2025