Feras Younes Hussein Fraige (Ayal Al-Husan)

Department of Mechanical Engineering
– Department of Mining and Minerals Engineering,
Faculty of Engineering – Al-Hussein Bin Talal University
Mobile: +962(0)788564979
Email: FERASFRAIGE@GMAIL.COM and DR.FERAS@AHU.EDU.JO
Research gate: https://www.researchgate.net/profile/Feras_Fraige

EDUCATION:

PhD in Engineering

Faculty of Engineering, The University of Nottingham, UK 2006
Integrated PhD (Combined Master Diploma in PhD program)
Thesis Title (Distinct Element Simulation of Granular Materials)

BSc in Mechanical Engineering, Thermal Power Branch

Department of Mechanical Engineering, Mu'tah University, Jordan 1998
First Class Honor (Excellent 86.39%)

General Secondary Certificate, Scientific Branch, Jordan 1994
Grade Excellent (90.1%)

PROFESSIONAL APPOINTMENTS/EMPLOYMENT:

Chairman of Mining and Minerals Engineering Department,
(AHU) 2021 – current

Professor, AHU 2023 (Promotion)

Associate Professor, AHU 2011 – 2023

Associate Professor, King Saud University @ Muzahimiyah Campus 2014 – 2021
(resignation)

Chairman of Mechanical Engineering Department,
Al-Hussein Bin Talal University (AHU) 2013 – 2014

Chairman of Mining and Minerals Engineering Department,
(AHU) 2013 – 2014

Associate Professor, AHU 2011 (Promotion)

Vice Dean, Faculty of Engineering, AHU 2008 – 2009

Acting Dean, Faculty of Engineering, AHU Intermittent periods in 2008 – 2009

Director of Services and Logistics Unit, AHU 2008

Assistant Professor, AHU 2006 – 2011, promotion

PhD Researcher, Faculty of Engineering, University of Nottingham, UK
2001 - 2006

Head of Strength of Materials Unit, Royal Scientific Society, Jordan
1999 - 2001

Maintenance Engineer, Jordanian Phosphate Mine Co and Jordan Petroleum Refinery Co.
1998 – 1999

KEY ACHIEVEMENTS, HONORS AND AWARDS:

Acting as Planner and Developer for Technical Programs at Al-Hussein Bin Talal University. Submitting proposal for new technical program entitled "Sustainable Process Technology" and supervised two other technical programs in the Faculty of Engineering, Submitted Feb. 2025.

Establishment of MSc program entitled "Sustainable Management of Engineering Projects" in Al-Hussein Bin Talal University – 2023.

Establishment of Applied Engineering Programs in King Saud University at Muzahimiyah Campus.

Establishment of Faculty of Engineering in Al-Hussein Bin Talal University.

Establishment of Mechanical Engineering Department in Al-Hussein Bin Talal University. Including setting study plan, course catalog, accreditation, laboratories preparation etc.

Establishment of Mining Engineering Department in Al-Hussein Bin Talal University. Including setting study plan, course catalog, accreditation, laboratories preparation etc.

Establishment of Workshop Department in Al-Hussein Bin Talal University, including preparation of machine and equipment specifications, tenders study, equipment purchase, equipment layout in the workshop, site preparation, workshop development plans, production schedule and plans, etc. The workshop is one of the largest workshops at universities level in the country.

Technical coordinator of the Saudi fund to establish scientific centers and laboratories in Al—Hussein Bin Talal University.

Deutsch Forschungsgemeinschaft (German Research Foundation, DFG) research partnership and cooperation visit to Germany 24 May 2012 to 21 August 2012 for testing rock experiments and developing simulation models and tools.

Best of Papers Prize during the 8th International Conference in Modeling and Simulation, Petra – Jordan, 18 – 20 Nov. 2008, and published in Proceeding ISBN 978-9957-8643-0-9.

Winning PhD scholarship in Engineering, 2001, Study place: University of Nottingham – UK, Support from Al-Hussein Bin Talal University

Winning B.Sc. Scholarship in Mechanical Engineering, 1994, Study place: Mu'tah University – Jordan, Support from Jordanian Ministry of Higher Education & Scientific Research.

First place in Mining Engineering Graduation projects Supervision Prize, Conducted by Jordanian Association of Engineers – 2013.

First place in Mining Engineering Graduation projects Supervision Prize, Conducted by Jordanian Association of Engineers – 2010.

PUBLICATIONS:

Journal Papers:

Langston, P.A., Al-Awamleh, M.A., **Fraige, F.Y.,** and Asmar, B.N., 2004, Distinct element modelling of non-spherical frictionless particle flow, Chemical Engineering Science, 59, pp.425 – 435.

Fraige, F.Y., and Langston, 2004, Integration schemes and damping algorithms in distinct element models, Advanced Powder Technology, 15, 2, pp.227 – 245.

Fraige, F.Y., and Langston, 2006, Horizontal pneumatic conveying: a 3D distinct element model, Granular Matter, 8, 2, pp. 67 – 80.

Fraige, F.Y., Langston, P.A., Matchett, A.J., and Dodds, J., 2008, Vibration induced flow in hoppers: DEM 2D polygon model, Particuology, Volume 6, Issue 6, December 2008, pp. 455-466.

Langston, P.A., Matchett, A.J., **Fraige, F.Y**., and Dodds, J., 2008, Vibration induced flow in hoppers: Continuum and DEM model approaches, Granular Matter, 11 (2), pp. 99 – 113.

Fraige, F.Y., Langston, P.A., and Chen, G.Z., 2008, Distinct element modeling of cubic particle packing and flow, Powder Technology, 186 (3), pp. 224 – 240.

Al-Khatib, L.A., **Fraige, F.Y.,** 2011, Assessment of Wastewater Treatment Plants Performance and Reuse opportunities, International Journal of Science and Technology, 6, 2, 2011.

Langston, P.A., Wang, J., Yu, H., and **Fraige, F.,** 2011, Particle Shape Effects in Discrete Element Modelling of Cohesive Angular Particles, Granular Matter, 13, 1 – 12.

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.

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.

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.

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.

Hani M. Alnawafleh; **Feras Y. Fraige**, 2013, Characterization of South and Central Jordan Oil Shales, European Journal of Scientific Research, 102, 4, 2013. Pp 589-595.

Mohammad Al-Hwaiti, Omar Al-Khashman, Laila Al-Khateeb, and **Feras Freig**, 2014, Radiological hazard assessment for building materials incorporating phosphogypsum made using Eshidiya mine rock in Jordan, Environmental Earth Sciences, 71, 2257 – 2266. DOI 10.1007/s12665-013-2629-z.

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. doi: 10.11648/j.jenr.20150404.11.

Alnawafleh, H.M. and **Fraige, F.Y.** (2015) Shale Oil Solvent Extraction of Central Jordan El-Lajjun Oil Shale. Journal of Analytical Sciences, Methods and Instrumentation, 5, 35-43. http://dx.doi.org/10.4236/jasmi.2015.53004

Alnawafleh, H.M.; **Fraige**, **F.Y.,** 2015, Analysis of selected Shale oil samples from El-Lajjun, central Jordan, Geomaterials, 5, 77 – 84. http://dx.doi.org/10.4236/gm.2015.53008

Alnawafleh, H.M., **Fraige, F.Y**., Tarawneh, K.E., Sarairah, I.A. and Al-Khatib, L.A. (2016) Fractional Yield, Extract Composition and Variability from Jordanian Oil Shales. Journal of Analytical Sciences, Methods and Instrumentation. Vol.6 No.3. Pp 51-63. http://dx.doi.org/10.4236/jasmi.2016.63007

Dweirj, M., **Fraige, F.**, Alnawafleh, H. and Titi, A. (2017) Geotechnical Characterization of Jordanian Limestone. Geomaterials, 7, 1-12. http://dx.doi.org/10.4236/gm.2017.7100

Fraige, F. Y., and Es-Saheb. M. H., (2022) Analysis of elastic stress wave propagation in stepped bars, transmission, reflection, and interaction: Experimental investigation, Jordan Journal of Mechanical & Industrial Engineering, 16 (2), March. 2022, pp 261 - 274. http://jjmie.hu.edu.jo/Vol16.htm. http://jjmie.hu.edu.jo/vol16-2/08-171-20.pdf

Fraige, Feras Y., Al-Khatib, Laila A., Al-Shaweesh, Mou'ath A., (2023), Predicting WEEE Generation Rates in Jordan Using Population Balance Model, Sustainability, 15 (3), 2845. pp. 1-17, https//:doi.org/10.3390/su15032845.

Khaled Tarawneh, Sleiman M AL- Zaidyeen, Mou'th Adnan Al Shaweesh, **Fraige, Feras Y.**, (2023), Volcanoes as a Sustainable Resource for Engineering Applications: A case study from Harrat Ash Shaam Basalt (HASB), NE Jordan, Civil and Environmental Research, Vol 15, No 3 (2023), https//:doi.org/10.7176/CER/15-3-04.

Al-Khatib, Laila A., **Fraige, Feras Y.,** (2024), The Potential Material Flow of WEEE in a Data-Constrained Environment—The Case of Jordan, Recycling, 9 (4), https://doi.org/10.3390/recycling9010004.

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.

Alma'asfa, S. I., Abdul Aziz, M. S., Khor, C. Y., & **Fraige, F. Y.** (2025), Impact of cooling configurations, fin thickness and phase change material on the thermal management

of cylindrical lithium-ion batteries, Thermal Science and Engineering Progress, Available online 19 April 2025, 103609, In Press, Journal Pre-proof dated 22-4-2025.

Awwad H. Titi, Rami Al Rawashdeh, **Feras Y. Fraige**, Mohammad K. Dweirj and Laila A. Al-khatib, 2025, Evaluation of Different In-Pit Haulage Patterns in an Oil Shale Mine Deposit, Journal of Mines, Metals and Fuels, 73(3): 589-605; 2025. https://doi.org/10.18311/jmmf/2025/45979.

CONFERENCE ACTIVITY/PARTICIPATION:

Fraige, F.Y., AlNawafleh, H.M., Al-Khatib, L.A., 2012, Solvent Extraction of Jordanian Oil Sahle, 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., AlNawafleh, 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., AlNawafleh, 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.

Jones, T.F., **Fraige, F.Y**., and Langston, P.A., 2007, Cubic particle shape models improve the understanding of particle-bearing media, Hydrotransport 17 Conference.

Wood, R.J.K., Jones, T.F., **Fraige, F.Y**. and Langston, P.A., 2004, Particle distribution patterns in pipeflow for modelling wear. Hydrotransport 16 Conference, 2004, pp. 595-608.

Fraige, F.Y., Langston, P.A, 2005, Distinct Element Modelling of Horizontal Pneumatic Conveying, presented at the 7th World Congress of Chemical Engineering held in Glasgow – Scotland, during 10 - 14 JULY 2005.

Organizing Committee of the 6th Jordanian International Mining Conference held in Amman – Jordan, 1 – 3 Nov. 2011.

Scientific Referee for papers submitted to the 6th Jordanian International Mining Conference held in Amman – Jordan, 1 – 3 Nov. 2011.

Organizing Committee of the 8th International Conference in Modeling and Simulation held in Petra – Jordan, 18 – 20 Nov. 2008.

Scientific Referee for papers submitted to the 8th International Conference in Modeling and Simulation held in Petra – Jordan, 18 – 20 Nov. 2008.

Co-Chair of multiple sessions in the Fifth Jordanian International Mining Conference held in Amman Sep. 2007.

Papers In Preparation:

Fraige, F.Y., Al-Khatib, L.A., Dweirj, M.K., AlNawafleh, H.M., Langston, P.A., E-waste Management in some developing countries: case study Jordan, in preparation.

Fraige, F.Y., M.K., AlNawafleh, Al-Khatib, L.A., Dweirj, H.M., Jordanian Oil Shale: variability and processing options, in preparation.

Fraige, F.Y., Al-Khatib, L.A., AlNawafleh, H.M., Dweirj, M.K., Metal recovery from shredded e-waste using vibration, in preparation.

Al-Khatib, L.A., **Fraige, F.Y.,** AlNawafleh, H.M., Dweirj, M.K., E-waste Assessment in some countries from MENA Region, in preparation.

Fraige, F.Y., Al-Khatib, L.A., AlNawafleh, H.M., Dweirj, M.K., Modelling of Metal recovery from vibrated shredded e-waste using Distinct Element Method, in preparation.

Fraige, F.Y., AlNawafleh, H.M., Solvation Variability of Jordanian Oil Shale Deposits, in preparation.

AlNawafleh, H.M., **Fraige, F.Y.,** Continuous Stirring Extraction behavior of Jordanian Oil Shale Deposits, in preparation.

Fraige, F.Y., AlNawafleh, H.M., Modelling Solvation Variability of Jordanian Oil Shale, in preparation.

AlNawafleh, H.M**., Fraige, F.Y**., Optimum Solvation Conditions of Jordanian Oil Shale, in preparation.

GRANTS AND PROJECTS:

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.

Prime Investigator, Field: Mechanics and Particle Technology, Fund $60,000.

Investigation into the flow conditions of the hydrocyclone

Funder: Scientific Research Fund, Ministry of Higher Education, Jordan 2008-2011.

Co - Investigator, Field: Multi-phase flow and Particle Technology, Fund $60,000.

Development of Fouling Resistant Membrane for Application in Water Treatment

Funder: Scientific Research Fund, Ministry of Higher Education, Jordan 2009-2013.

Co - Investigator, Field: Water treatment by Membrane and Nano-technology, Fund $115,000.

Utilization of Oil Shale as a Source of Energy in Jordan; Direct Burning and Shale Oil Extraction, Phase I

Funder: Scientific Research Fund, Ministry of Higher Education, Jordan 2009-2012.

Co - Investigator, Field: Energy and Mineral Processing, Fund $407,000.

Recovery of Jordanian Shale Oil – Phase I: Solvent Extraction

Funder: Al-Hussein Bin Talal University, Jordan 2009-2012.

Co - Investigator, Field: Energy and Mineral Processing, Fund $14,000.

Total Fund: $656,000.

RESEARCH EXPERIENCE:

Sustainability, Energy and Minerals:

Renewable energy modeling, sustainability of energy and resources, Processing of oil shale. More efficient and environmentally friendly techniques for oil shale processing are under investigation. Also, optimizing the particle size of Jordanian phosphate feed to flotation units is under consideration.

Rock Mechanics Modeling:

Rock mechanics model investigate the effect of various parameter of rock strength and other physical parameters such as elastic modulus.

Applied and theoretical Mechanics:

Modeling solids and granular materials flow and packing, multiphase flow like pneumatic conveying in horizontal pipes, solid particle separation due to vibration. Techniques to enhance flow such as using vibration are modeled. Particle shape effect has a considerable effect on granular material flow. This is modeled using DEM for various shapes.

Electronic waste (e-waste) Management, Separation and Modeling|:

The management of electronic waste (e-waste) in Jordan and Arab Countries. The investigator is developing a management and legal system for e-waste applicable to the country and neighboring countries. Also, the investigator is developing a sounder technique to recycle e-waste using mechanical vibration.

Water Treatment:

Sharing in establishing a new project for treating the water resulting from the Jordanian phosphate flotation units. Water and wastewater treatment is under investigation by monitoring water quality and developing clarification techniques such as membrane and adsorption.

Structural Analysis:

This includes modeling structural systems like bridges and ancient architecture. Effects of earthquakes on building stability and durability are to be investigated.

SERVICE TO PROFESSION:

Reviewer for many journals in Engineering such as Journal of Environmental Management.

Reviewer in many conferences such as the 6th Jordanian International Mining Conference held in Amman – Jordan, 1 – 3 Nov. 2011.

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

DEPARTMENTAL/UNIVERSITY SERVICE (AHU):

Faculty of Engineering Council Member	2021 - present
Faculty of Engineering Council Member	2013 - 2014
Faculty of Engineering Council Member	2007 - 2009
Mechanical Engineering Department Council Member,	2013 – present
Mining Engineering Department Council Member,	2006 – present
Employment Affair Committee Member	2008
Al-Hussien Bin Talal School and Nursery Committee Member	2008
Employee Club Committee Member	2008
Computer and Information Technology Center Member	2008
8th International Conference on Modelling and Simulation (MS08) program committee	
Housing Committee Member	2008
Head of Workshop Tender Preparation Committee.	2009-2010
Head of Workshop Tender Technical Study Committee.	2010-2011
Head of Equipment Investment Committee.	2009
Accreditation Committee member	2011

Surveying Engineering Study Committee member. 2011

University Representative to the Jordanian Association for Engineers 2009

Organizing Committee member of 6th Jordanian International Mining Conference to be held in Amman 2011.

Scientific Committee member of 6th Jordanian International Mining Conference to be held in Amman. 2011.

Mechanical Engineering Department Establishment Committee member. 2012 – 2013

Quality Committee Head, Applied Engineering Programs, KSU-Muz, 2014 – 2016

Quality Committee member, Applied Engineering Programs, KSU-Muz, 2016 – current.

Academic Committee member, Applied Engineering Programs, KSU-Muz, 2015 – current.

Tenders Committee member, Applied Engineering Programs, KSU-Muz, 2015 – current.

Supplies Committee member, Applied Engineering Programs, KSU-Muz, 2016 – current.

COURSES ATTENDED:

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:

Physics I for Engineers, Physics II for Engineers, AutoCAD, Engineering Drawing, Statics, Dynamics, Engineering Mechanics, Strength of Materials, , Introduction to Mechanics of Materials, Strength of Materials Lab., Engineering Workshops, Graduation Projects, Special Topics, Mining Methods (surface and underground), Mine Machines and Equipment Design, Special Topics in Mining Eng., Mine Power Systems, Electric Circuits and Machines in Mines, Introduction to Petroleum Engineering.

TEACHING AREAS/COURSES PREPARED TO TEACH:

Power Generation, Renewable Energy, Ventilation systems, Machine Theory, Manufacturing Processes, Internal Combustion Engines, Mechanical Design, Energy Conversion, HVAC, Advance Fluid Mechanics, Engineering Management, Automatic Control.

LANGUAGES:

Arabic: native speaker.

English: Excellent in Speaking, Reading, and Writing.

SKILLS:

English language (fluent),
Computer Use (Expert)
Programing languages (Python, C++, and other OOP PLs)

REFERENCES:

To be given upon request.

Last updated: 12/5/2025