

Curriculum Vitae



- ❖ **Name:** Naim Moh'd Abdallah Faqir
- ❖ **Mailing Address:** Chemical Engineering Department
School of Engineering
The University of Jordan
Amman 11942
Jordan

Tel: (Office) + 962-6- 535 5000 ext. 22880

Mobile: +962-79 160 1858

Email: faqir@ju.edu.jo

- ❖ **Academic Rank:** Professor
- ❖ **Education:**
 - ◆ **Ph.D. in Chemical Engineering 1990**
Northwestern University, Evanston, IL-U.S.A.
Dissertation: *Design of General Batch Chemical Plants*
 - ◆ **M.Sc. in Chemical Engineering 1985**
Northwestern University, Evanston, IL- U.S.A.
Thesis: *Computer-Aided Design of a Controller in a Feedback Controlled System*
 - ◆ **Diploma in Chemical Engineering 1978**
Polytechnic Institute of Bucharest, Romania.

- ❖ **Employment and Teaching Experience:**

2014-present Chemical Engineering Department
Faculty of Engineering & Technology
University of Jordan

Oct. 2017-Sept. 2023 Deputy Dean for Quality Affairs & Accreditation
School of Engineering- University of Jordan

Oct. 2016-Sept. 2017	Deputy Dean for Student Affairs University of Jordan
Sept. 2007-Aug. 2014	Chemical Engineering Department King Fahd University of Petroleum & Minerals (KFUPM)-Saudi Arabia
1990-2007	Chemical Engineering Department Faculty of Engineering & Technology University of Jordan
2002-2005	Head of Chemical Engineering Department Faculty of Engineering & Technology University of Jordan
2000-2001	Sabbatical Leave, Chemical Engineering Department Amman College of Engineering & Technology Al-Balqa' Applied University Amman-Jordan
1999-2000	Assistant Dean for Student Affairs Faculty of Engineering & Technology University of Jordan
1993-1997	Assistant Dean for Student Affairs & Training Faculty of Engineering & Technology University of Jordan
1981-1982	Research and Teaching Assistant Faculty of Engineering & Technology University of Jordan
1979-1981	Production Engineer Jordan Petroleum Refinery Company Zarka – Jordan

❖ **Exact Specialization:** Process Design and Optimization

My research interests are related to process modeling, simulation, operation and optimization of chemical processes. Numerical optimization of bioreactors; computational techniques for extraction processes; and dynamic simulation of chemical processes using commercial software packages like *Aspen PLUS*, *Aspen HYSYS*; and Chemical stabilization of natural clay minerals. Of special interest are:

- Modeling and Optimization of Extraction Processes
- Modeling, Design, and Optimization of Bioreactors
- Modeling and Simulation of Adsorption Processes
- Flowsheet decomposition and tearing for process simulation
- Chemical stabilization of natural geomaterials
- Production Planning, Scheduling and Design of Batch Plants
- Process Control

❖ Awards:

- ◆ Technical University of Kaiserslautern **Research Fellowship Awards, summer of 2012, 2010, 2007, 2006, 2004, 2003, 2002 and 2001**. Visiting Professor at the Institute of Thermal Process Engineering, Faculty of Mechanical and Process Engineering, **Technical University of Kaiserslautern, GERMANY**.
- ◆ Jordan University Award for **Distinguished Paper** for the academic year **2003/2004**. The research work is published in *Biotechnology and Bioengineering*, 77, 163-173.
- ◆ **German DAAD Research Fellowship Award, summer of 1997**. Visiting Professor at the Institute of Thermal Process Engineering, Faculty of Mechanical and Process Engineering, **Technical University of Kaiserslautern, GERMANY**.
- ◆ **USAID Fellowship Award, summer of 1994**. Special **Summer Program** in *Modeling, Simulation and Optimization of Chemical Processes*, **Massachusetts Institute of Technology (MIT), USA**.

◆ Patents:

1. Mirghani, M.; Shawabkeh, R.; Faqir, N.; Al-harhi, M.; Ba-Shammakh, M. US patent No. **9,193,608** "*Removal of Heavy Metals from Aqueous Solutions using Vanadium-doped TiO₂ Nanoparticles*".
 2. Shawabkeh, R.; Faqir, N.; Bkour, Q., U.S. Patent 20150209758 A1 "Synthesis of CO₂- ONE adsorbent for CO₂ removal".
 3. Shawabkeh, R.; Faqir, N.; Bkour, Q., US Patent 9,616,407, 2017" Isothermal CO₂ adsorption column".
 4. Shawabkeh, R.; Faqir, N.; Bkour, Q., US Patent 9,649,619, 2017 "Sodium-calcium-aluminosilicate column for adsorbing CO₂",.
1. **Naim M. Faqir, Salaheldin Elkatatny , Mohammad Mahmoud , Reyad Shawabkeh, (2017) "** Fabrication of kaolin-based cement plug for CO₂ storage wells", *Applied Clay Science*, **141, 81–87**

❖ Publications:

1. Tamara T Nwaisr, **Naim M Faqir**, Basel Al-Saida, Reyad A Shawabkeh (2024) "Adsorption and interaction of CO₂ and N₂O on NaOH-impregnated activated carbon surface", *Emergent Materials* **7**.
2. Reyad A Shawabkeh, **Naim M Faqir**, Khaled M Rawajfeh, Ibelwaleed A Hussein, Ahmed Hamza" (2022) "Adsorption of CO₂ on Cu/SiO₂ nano-catalyst: Experimental and theoretical study", *Applied Surface Science* **586, 152726**
3. **Naim M. Faqir, Reyad Shawabkeh, Mamdouh Al-Harhi, Hamad Abdul Wahhab, (2019)** "Fabrication of Geopolymers from Untreated Kaolin Clay for Construction Purposes", *Geotechnical and Geological Engineering* **37,129–137**

4. **Naim M. Faqir**, Salaheldin Elkatatny , Mohammmd Mahmoud , Reyad Shawabkeh, (2017) " Fabrication of kaolin-based cement plug for CO₂ storage wells", **Applied Clay Science**, **141**, 81–87
5. Qusay Bkour, **Naim Faqir**, Reyad Shawabkeh, Anwar Ul-Hamid, Hans-Jörg Bart (2016) "Synthesis of a Ca/Na-aluminosilicate from kaolin and limestone and its use for adsorption of CO₂" **Journal of Environmental Chemical Engineering** **4**, 973–983
6. Reyad A. Shawabkeh, Musab Gaily, Tahir Laui, **Naim Faqir**, Mamdouh Al-Harithi, Mohammad Ba-Shammakh," Synthesis and Characterization of Fe-doped Nanotitania Using Sol-Gel Technique and Application for Zn²⁺ Reduction from Aqueous Solution"; 9th International Conference on Advances and trends in Engineering materials and their applications, Montreal, Canada, August 01-05, 2012.
7. Reyad A. Shawabkeh, Musab Gaily, Tahir Laui, **Naim Faqir**, Mamdouh Al-Harithi, Mohammad Ba-Shammakh, "Synthesis of V-TiO₂ nanoparticles and Application for Reduction of Cd²⁺ from Aqueous solution", **6th International Conference On Environmental Science and Technology**, Houston, Texas, USA June 25-29, 2012.
8. Musab Gaily , **Naim Faqir**, Reyad A. Shawabkeh, Tahir Laui, Mamdouh Al-Harithi, Mohammad Ba-Shammakh, "Synthesis of Tungsten-Doped Titania Nanoparticles and Applications for Photo-Degradation of Methylene Blue, Zn²⁺ and Pb²⁺ from Aqueous Solutions", **6th International Conference On Environmental Science and Technology**, Houston, Texas, USA June 25-29, 2012
9. Binous, H.; Al-Muairi, E.; and **Faqir, N.** (2011) "Study of the Separation of Simple Binary and Ternary Mixtures of Aromatic Compounds". Accepted for publication in **Computer Applications in Engineering Education**.
10. Bello, M.; Zaidi, S. M. J; and **Faqir, N.M.** (2010) "Multi-Objective Function Optimization for PEM Fuel Cell System". **ECS Transactions -The Electrochemical Society**, 26 (1), 77-88.
11. Naddaf, A.; Bart, H.-J.; Kratz, L.; Detemple, P.; Schmitt, S.; Hessel, V.; and **Faqir, N.** (2009) "Microfabricated Hydrogen Sensitive Membranes". **Chemical Engineering & Technology**, **32**, 103-113.
12. Attarakih, M. M.; Bart, H.-J.; Steinmetz, T., Dietzen, M; and **Faqir, N. M.** (2008). "LLECMOD: A Bivariate Population Balance Simulation Tool for Liquid-Liquid Extraction Columns". **The Open Chemical Engineering Journal**, **2**, 10-34.
13. Attarakih M. M.; Jaradatb M.,c, Allabounb H.; Bart H-J; and **Faqir N. M.** (2008) "Dynamic Modeling of a Rotating Disk Contactor Using the Primary and Secondary Particle Method (PSPM)". **European Symposium on Computer Aided Process Engineering (ESCAPE 18)**, France.
14. Houry, H., Hodali, H., Hourani, M., Mubarak, Y., **Faqir, N.**, Hanayneh, B., Esaifan, M., (2008) "Mineral Polymerization of Some Industrial Rocks and Minerlas in Jordan." Publications of Deanship of Academic Research, University of Jordan, Jordan.
15. Attarakih, M. M.; Bart, H.-J.; and **Faqir, N. M.** (2007) "Solution of Population Balance Equation Using the Sectional Quadrature Method of Moments (SQMOM)". **3rd Population Balance Conference**, Canada.

16. Attarakih, M. M.; Bart, H.-J.; and **Faqir, N. M.** (2006) "A hybrid scheme for the Solution of the Bivariate Spatially Distributed Population Balance Equation". *Chemical Engineering & Technology*, **29**, 435-441.
17. Attarakih, M. M.; Bart, H.-J.; and **Faqir, N. M.** (2006) "Solution of the Population Balance Equation using the Sectional Quadrature Method of Moments (SQMOM)". In *Proceedings of European Symposium on Computer Aided Process Engineering-16 (ESCAPE-16)*, 209-214, Editors: Marquardt, W.; and Pantelides, C., Elsevier. 2006.
18. Attarakih, M. M.; Bart, H.-J.; and **Faqir, N. M.** (2006) "Numerical Solution of the Bivariate Population Balance Equation for the Interacting Hydrodynamics and Mass Transfer in Liquid-Liquid Extraction Columns". *Chemical Engineering Science*, **61**, 113-123.
19. Attarakih, M. M.; Bart, H.-J.; and **Faqir, N. M.** (2006) "LLECMOD: A Windows-Based Program for Hydrodynamics Simulation of Liquid-Liquid Extraction Columns". *Chemical Engineering and Processing*, **45**, 113-123.
20. Ibrahim, J.Y.; and **Faqir, N. M.** (2006) "Optimal Design of a Series of CSTRs Performing Reversible Michaelis-Menten Reaction under Specified Temperature Mode". *Mu'tah Journal*, **21**, 121-138.
21. **Faqir, N. M.** (2005) "Operating Temperature Profile for Immobilized Enzyme Lactose Hydrolysis Reactor Operating at Constant Conversion". *Alexandria Engineering Journal*, **44**, 449-461.
22. Attarakih, M. M.; Bart, H.-J.; and **Faqir, N. M.** (2005) "The Bivariate Spatially distributed Population Balance Equation: An Accurate Reduction Technique". In *Proceedings of European Symposium on Computer Aided Process Engineering-15 (ESCAPE-15)*, 163-168, Editors: Puigjaner, L.; and Espuna, A., Elsevier.
23. Attarakih, M. M.; Bart, H.-J.; and **Faqir, N. M.** (2004) "Berechnung von Flussig/Flussig Extraktionskolonnen". *Chemie Ingenieur Technik*, **76**, 1412-1413.
24. **Faqir, N. M.** (2004) "Optimization of Operating Temperature for a Continuous Immobilized Glucose Isomerase Reactor with Pseudo Linear Kinetics". *Engineering in Life Sciences*, **4**, 450-459.
25. Attarakih, M. M.; Bart, H. J.; and **Faqir, N. M.** (2004) "Solution of the Droplet Breakage Equation for Interacting Liquid-Liquid Dispersions: A Conservative Discretization Approach". *Chemical Engineering Science*, **59**, 2547-2565.
26. Attarakih, M. M., Bart, H. J., & **Faqir, N. M.** (2004). Berchnung von fluessig-fluessig Extraktionskolonnen auf Basis bivarianter Populationsbilanzen. *DECHEMA/GVC – Jahrestagungen*, 12-14 Oktober 2004, Karlsruhe, Germany.
27. Attarakih, M. M.; Bart, H.-J., and **Faqir, N. M.** (2004) "Numerical Solution of the Spatially Distributed Population Balance Equation Describing the Hydrodynamics of Interacting Liquid-Liquid Dispersions". *Chemical Engineering Science*, **59**, 2567-2592.
28. Attarakih, M. M.; Bart, H.-J., and **Faqir, N. M.** (2004) "Numerical Solution of the Bivariate Population Balance Equation for Interacting Hydrodynamics and Mass Transfer in Liquid-Liquid Extraction Columns". In *Proceedings 2nd International Conf. on Population Balance Modelling*, Editors: Nopoen. J, Malisse K., Biggs C.A., and Dcoste J.J., EUROSIS, Ghent, Belgium

29. Attarakih, M. M.; Bart, H. J.; and **Faqir, N. M. (2003)** “Optimal Moving and Fixed Grids for the Solution of Discretized Population Balances in Batch and Continuous Systems: Droplet Breakage”. *Chemical Engineering Science*, **58**, 1251-1269.
30. Attarakih, M. M.; Bart, H.-J.; and **Faqir, N. M. (2003)** “Solution of the Population Balance Equation for Liquid-Liquid Extraction Columns using a Generalized Fixed-Pivot and Central Difference Schemes”. In *Proceedings of European Symposium on Computer Aided Process Engineering-13 (ESCAPE-13)*, 557-562, Editors: Kraslawski, A.; and Turunen, I., Elsevier.
31. **Faqir, N. M. (2003)** “Optimal Temperature-Time Policy for Immobilized Packed Bed Reactor Performing Reversible Michaelis-Menten Kinetics in the Presence of Product in the Feed Using Nonlinear Programming”. *The Fifth Egyptian-Syrian Conference On Chemical & Petroleum Engineering*, **1**, 270-284, Suez Canal University, Suez, Egypt.
32. **Faqir, N. M.; and Attarakih, M. M. (2002)** “Optimal Temperature Policy for Immobilized Enzyme Packed Bed Reactor Performing Reversible Michaelis-Menten Kinetics using the Disjoint Policy”. *Biotechnology and Bioengineering*, **77**, 163-173.
33. Attarakih, M. M.; Bart, H.-J.; and **Faqir, N. M. (2002)** “An Approximate Optimal Moving Grid Technique for the Solution of Discretized Population Balances in Batch Systems”. In *Proceedings of European Symposium on Computer Aided Process Engineering-12 (ESCAPE-12)*, 823-828, Editors: Grievink, J.; and Schijndel, J. van, Elsevier.
34. Ibrahim, J.Y.; and **Faqir, N. M. (2001)** “Optimal Design of a Series of CSTRs Performing Reversible Michaelis-Menten Reaction Catalyzed by Soluble Enzyme”. In *Proceedings of First International Chemical Engineering Conference*, 495-510, University of Jordan, Amman, Jordan.
35. Gu, J.; **Faqir, N. M.; and Bart, H.-J. (1999)** “Drying of an Activated Carbon Column after Steam Regeneration”. *Chemical Engineering & Technology*, **22**, 859-864.
36. **Faqir, N. M.; and Attarakih, M. M. (1999)** “Optimum Design of a Series of CSTRs Performing Reversible Michaelis-Menten Kinetics: a Rigorous Mathematical Study”. *Bioprocess Engineering*, **20**, 329-335.
37. Gu, J.; **Faqir, N. M.; and Bart, H.-J. (1999)** “Trocknungsverfahren der Aktivkohleschüttung nach Wasserdampfregeneration”. *Chemie Ingenieur Technik*, **71**, 511-514.
38. **Faqir, N. M.; and Abu-Reesh, I.M. (1998)** “Optimum Temperature Operation Mode for Glucose Isomerase Reactor Operating at Constant Glucose Conversion”. *Bioprocess Engineering*, **19**, 11-17.
39. **Faqir, N. M. (1998)** “Optimization of Glucose Isomerase Reactor: Optimum Operating Temperature Mode”. *Bioprocess Engineering*, **18**, 389-396.
40. Gu, J.; Bart, H.-J.; and **Faqir, N. M. (1998)** “Trocknungsverfahren der Aktivkohleschüttung nach Wasserdampfregeneration”, Presented at the *DECHEMA – Arbeitsausschuss “Adsorption”*, Munich, GERMANY.

41. Haj Kali, R. A.; Jubran, B. A.; and **Faqir, N. M.** (1997) "Optimization of Solar Pond Electrical Power Generation System". *Energy Conversion and Management*, **38**, 787-798.
42. Abu-Reesh, I.M.; and **Faqir, N. M.** (1996) "Simulation of Glucose Isomerase Reactor: Optimum Operating Temperature". *Bioprocess Engineering*, **14**, 205-210.
43. Tobgy, A. H.; **Faqir, N. M.**; and Shawabkeh, R. A. (1995) "Rating of Extraction Columns with Backmixing". *Dirasat*, **22B**, 579-596.
44. **Faqir, N. M.**; and I. A. Karimi. (1990) "Design of Multipurpose Batch Plants with Multiple Production Routes". *Proceedings of the Third International Conference on Foundations of Computer-Aided Process Design*, 451-468, Editors: Siirola J.J.; Grossmann, I.E.; and G. Stephanopoulos, CACHE, Elsevier.
45. **Faqir, N. M.**; and Karimi, I. A. (1989) "Optimal Design of Batch Plants With Single Production Routes". *Industrial Engineering and Chemistry Research*, **28**, 1191-1202.

◆ In cooperation with **Prof. Bart, chair of Institute of Thermal Process Engineering** at the **Technical University of Kaiserslautern-Germany**, I co-supervised Ph.D students. The outcome of this on going joint research, which started in 1997 up to now, resulted in the publication of several papers in **Chemical Engineering Science Journal, Chemical Engineering and Processing Journal, Chemical Engineering Technology Journal**, and **proceedings of European Symposium on Computer Aided Process Engineering (ESCAPE) series**.

◆ Supervised M.Sc. students in **Chemical, Industrial, and Mechanical Engineering** Departments at the **University of Jordan**.

◆ **Co-Supervised Ph.D. Thesis** (Technical University of Kaiserslautern, Germany):

Solution Methodologies for the Population Balance Equations Describing the Hydrodynamics of Liquid-Liquid Extraction Contactors (**Kaiserslautern University 2004, Germany**).

Supervised M.Sc. Theses:

- ◆ Rating of Isothermal, Multistage, Multicomponent, Counter-Current, Liquid – Liquid Extraction Units.
- ◆ Simulation of a Carnalite Pan Fed by Concentrated Dead Sea Brine.
- ◆ Optimal Design of a Series of CSTRs Performing Reversible Michaelis-Menten Reaction Catalyzed by Soluble Enzyme.
- ◆ Stability and Multiplicity Analysis of Continuous Stirred Tank Bioreactor Performing Various Microbial Growth Models.
- ◆ Dynamic Study of Immobilized Enzyme Packed Bed Reactor Performing Reversible Michaelis-Menten Kinetics with Enzyme Deactivation.
- ◆ Optimization of Operating Temperature for Enzymatic Hydrolysis of Lactose.
- ◆ Variability in Scheduling Batch Operations (**Industrial Engineering**).
- ◆ Simulation and Optimization of Electric Power Generation by Solar Ponds in Jordan (**Mechanical Engineering**).
- ◆ Production and Characterization of Hydrogen-Selective Thin Layer Membranes

Reviewer for:

- ◆ Chemical Engineering Science Journal

- ◆ Chemical Engineering Communications Journal
- ◆ Biotechnology Progress Journal
- ◆ Reaction Kinetics, Mechanisms and Catalysis Journal
- ◆ The Arabian Journal for Science and Engineering
- ◆ Dirasat Scientific Journal (University of Jordan)
- ◆ Mu'ta Scientific Journal (University of Mu'ta)
- ◆ Almanar Journal (Al al-Bayt University)

❖ **Significant Courses:**

Chemical Engineering Principles, Chemical Process Design, Chemical Process Simulation, Thermodynamics, Transport Phenomena, Separation Processes, Biochemical Engineering, Process Control, Numerical Methods, Probability and Statistics, Linear and Integer Programming, Nonlinear Optimization, and Computer Applications using Aspen HYSYS, MATLAB and GAMS.

Short Courses:

- ◆ Distillation Control (ARAMCO).
- ◆ Instrumentation and Control (SABIC).

❖ **Projects:**

- ◆ Synthesis of nano-zeolite and application for removal of CO₂ from natural gas stream. Funded by **Deanship of Research/University of Jordan**
- ◆ Modeling and control of crude distillation unit. Funded by **NSTIP/KACST**.
- ◆ Fabrication of Mineral Polymeric Materials from Local Saudi Mineral Resources for Construction Purposes using Mineral Polymerization Technique. Funded by **NSTIP/KACST**.
- ◆ Adsorption of Carbon Dioxide Gas by Chemically Treated limestone. Funded by **Deanship of Academic Research at KFUPM**.
- ◆ Synthesis of titania nanofiber and its application for oxidation/reduction of solutes from aqueous solution. Funded by **KACST**
- ◆ Mineral polymerization of some industrial rocks and minerals in Jordan. Funded by **Deanship of Academic Research at University of Jordan**.
- ◆ Stabilization of Jordanian Soils for Water Harvesting Purposes. **Funded by Belgium Government, joint project between University of Jordan and Vrije University in Brussel-Belgium**.
- ◆ Preliminary Study on Mercury Removal From Gas Processing Plants. **Funded By ARAMCO**
- ◆ Modeling of fractionating extraction columns. **Funded by Technical University of Kaiserslautern-Germany**
- ◆ Simulation of single and binary gaseous organic adsorption on activated carbon using fixed-bed columns using MATLAB. **Funded by Technical University of Kaiserslautern-Germany**

❖ **References:**

1. **Prof. Dipl.-Ing. Dr. techn. Hans-Jörg Bart** Department of Mechanical and Process Engineering University of Kaiserslautern
Gottlieb-Daimler-St 67663 Kaiserslautern, GERMANY
Telephone: +49 631/205-2417
Fax: +49 631/205-3600
email: bart@mv.uni-kl.de
2. **Prof. Housam Binous**
Chemical Engineering Department,
National Institute of Applied Sciences and Technology, University of Carthage,
Tunis,
TUNISIA
email binoushousam@yahoo.com
3. **Prof. Reyad Shawabkeh**
Chemical Engineering Department School of Engineering
The University of Jordan Amman 11942
Jordan
email rshawabk@ju.edu.jo