

Curriculum Vitae



- ❖ **Name:** Naim Moh'd Abdallah Faqir
- ❖ **Mailing Address:** University of Jordan
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- ❖ **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.

- ❖ **Exact Specialization:** Process Optimization

My research interests are related to process modeling and optimization of chemical processes and biochemical reactors. In particular, it is mainly focused on the application of the principles of chemical engineering, development of numerical computational techniques, and nonlinear optimization to the solution of problems in the liquid-liquid extraction processes and optimization of bioreactors.

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 streams selection for process simulation
- Chemical stabilization of natural geomaterials
- Production Planning, Scheduling and Design of Batch Plants
- Process Control

❖ Awards:

- ◆ Kaiserslautern University **Research Fellowship Awards, summer of 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.**

❖ Publications:

1. 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.
2. 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.*
3. 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.*
4. 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.
5. 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.
6. 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.

7. 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.
8. 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.
9. **Faqir, N. M.** (2005) "Operating Temperature Profile for Immobilized Enzyme Lactose Hydrolysis Reactor Operating at Constant Conversion". *Alexandria Engineering Journal*, **44**, 449-461.
10. 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.
11. Attarakih, M. M.; Bart, H.-J.; and **Faqir, N. M.** (2004) "Berechnung von Flussig/Flussig Extraktionskolonnen". *Chemie Ingenieur Technik*, **76**, 1412-1413.
12. **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.
13. 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.
14. 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.
15. 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.
16. 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
17. 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.
18. 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.
19. **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.
20. **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.
 21. 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.
 22. 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**.
 23. 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.
 24. **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.
 25. Gu, J.; **Faqir, N. M.**; and Bart, H.-J. (1999) "Trocknungsverfahren der Aktivkohleschuttung nach Wasserdampfregeneration". *Chemie Ingenieur Technik*, **71**, 511-514.
 26. **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.
 27. **Faqir, N. M.** (1998) "Optimization of Glucose Isomerase Reactor: Optimum Operating Temperature Mode". *Bioprocess Engineering*, **18**, 389-396.
 28. Gu, J.; Bart, H.-J.; and **Faqir, N. M.** (1998) "Trocknungsverfahren der Aktivkohleschuttung nach Wasserdampfregeneration", Presented at the **DECHEMA – Arbeitsausschuss "Adsorption"**, Munich, **GERMANY**.
 29. 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.
 30. Abu-Reesh, I.M.; and **Faqir, N. M.** (1996) "Simulation of Glucose Isomerase Reactor: Optimum Operating Temperature". *Bioprocess Engineering*, **14**, 205-210.
 31. Tobgy, A. H.; **Faqir, N. M.**; and Shawabkeh, R. A. (1995) "Rating of Extraction Columns with Backmixing". *Dirasat*, **22B**, 579-596.
 32. **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: Sirola J.J.; Grossmann, I.E.; and G. Stephanopoulos, CACHE, Elsevier.

33. **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.

❖ **Employment and Teaching Experience:**

- ◆ **Sept. 2007-present** Chemical Engineering Department
King Fahd University of Petroleum & Minerals

- 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

- ◆ Co-Supervising Ph.D. students at the **Institute of Thermal Process Engineering**, Faculty of Mechanical and Process Engineering, **Technical University of Kaiserslautern-GERMANY**.
- ◆ Supervising 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**).

M.Sc. Theses Under Supervision:

- ◆ Dynamic Modeling of a Rotating Disk Contactor (RDC) Extraction Column.

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
- ◆ 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 Process Design, Plant Design, Modeling and Simulation of Chemical Processes, Thermodynamics, Transport Phenomena, Heat Transfer, Heat and Mass Transfer, Biochemical Engineering, Chemical Reaction Engineering, Process Control, Numerical Methods, Probability and Statistics, Differential Equations, Linear Algebra, Operations Research, Linear and Integer Programming, Nonlinear Optimization, and Computer Applications Using MATLAB and GAMS.

❖ Projects:

- ◆ Synthesis of Titania Nanofibers and Application for Photocatalytic Reduction of Heavy Metals from Aqueous Solution.
- ◆ Preliminary Study on Mercury Removal From Gas Processing Plants.
- ◆ Modeling of fractionating extraction columns.
- ◆ Dynamic modeling of activated carbon columns using Aspen Plus.
- ◆ Simulation of single and binary gaseous organic adsorption on activated carbon using fixed-bed columns using MATLAB.
- ◆ Mineral polymerization of some industrial rocks and minerals in Jordan.

- ◆ Equilibrium in systems associated with upgrading of commercial grade wet process phosphoric acid to food and/or pharmaceutical grade.
- ◆ Ph control of industrial wastes in Jordan.