

Dr. Farah M. Al-Duweesh

Chemical Engineering Department, College of Engineering and Petroleum
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EDUCATION

University of California Los Angeles, Los Angeles, CA Samueli School of Engineering Doctor in Philosophy, Chemical Engineering	September 2021
University of Southern California, Los Angeles, CA Viterbi School of Engineering Master of Science, Chemical Engineering	December 2016
Kuwait University, Kuwait College of Engineering and Petroleum Bachelor of Science, Chemical Engineering	May 2014

AFFILIATIONS

American Institution for Chemical Engineering (AIChE)	2013-2014 2021
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TECHNICAL SKILLS

Algorithm and Computational:	Mathmatica, Polymath
Programming Languages:	C++, Matlab, VBA
Design, Modeling and Simulation:	ASPEN HYSYS, Unisim, AutoCAD, COMSOL Multiphysics®
Applications:	Capcost , System Advisor Model x64 (SAM)

RESEARCH TOPICS

- Process Optimization
- Process Design
- Environmental Sustainability (land, water and air), mainly Water-Energy Nexus
- Energy Efficiency

CORE COMPETENCIES

Optimization

- Linear Programming (LP), Convex Non-Linear Optimization (CNL), Mixed Integer Programming (MIP)

Transfer Phenomena

- Solving Multidimensional Heat equations (Steady state and Unsteady states); Complex Combination Method; Implementation of Partial Differential equations (PDEs); Solving Bessel Functions; Unsteady-state Diffusion with Bimolecular Reactions; Parameter Simplification, Lumping Systems; Variation of Parameter Method; Multidimensional Systems in Cylindrical Coordinates; Superposition and Duhamel's Theorem etc.

Mathematical Implementation methods

- Eigenfunction Expansion and Finite Fourier Transform; Laplace transformations etc.

Quantum Science:

- Quantum Mechanics, Thermodynamics Equilibria; Fluid phase Equilibria

ACADEMIC Experience

KU Experience

United Nations Day Youth Driving Ambition for Climate Change Exhibition October 2022
Involved in a discussion panel about “Healthy Smart Cities” by introducing Sustainable System on the Water- Energy Nexus in Kuwait.

Kuwait Oil Company (KOC), Training Course May 2024
Illustrated a training course on “Energy Transitions- Renewable Energy Opportunities in Gas Processing” and “Sustainable Gas Processing Plants” specifically in the Middle East.

USC Experience

October-November 2016

The Future of Sustainable Public Transit in Los Angeles: A Comparison of Electric Small-Scale Vehicles and Autonomous Cars

Research to compare specifically car emissions and energy intensity of the Level 4 autonomous taxis vs. electric taxis vs. electric busses. Basically, comparing future technology in the public transit by the year 2030 in Los Angeles, to see which public vehicle would be more efficient regarding emissions and energy usage.

NOTABLE PUBLICATIONS

- Duweesh, F. A., Al-Husseini, Z., & Manousiouthakis, V. I. (2019). Optimization of a 3-D isothermal plug-flow model of a monolith reactor featuring first order reactions. *Chemical Engineering Research and Design*, 146, 528–539.
- Al-Duweesh, F. M., & Manousiouthakis, V. I. (2021). Optimization of a monolith reactor 3-D developed laminar flow model. *Chemical Engineering Research and Design*, 170, 406–422.

PENDING PUBLICATIONS

- *Necessary Conditions of Optimality-based Optimization of a 3-D Isothermal Plug-Flow Model of a Monolith Reactor Featuring First Order Bulk and Surface Reactions*
- *Optimization of a Monolith Reactor’s 3-D Nonisothermal Developed Laminar Flow Model*

TEACHING COURSES

CHE 241 – FLUID MECHANICS

CHE 304 – INTRODUCTION TO ENVIRONMENTAL ENGINEERING

CHE 345 – MASS TRANSFER

CHE 457 – OPTIMIZATION TECHNIQUES

CHE 461 – WATER DESALINATION