Professor Hayder Abdul-Razzak
Curriculum Vitae

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1 832 439 7080
Hayder1959@yahoo.com

Education

Ph.D. (Mechanical Engineering) Illinois Institute of Technology, 1988
M.S. (Mechanical and Aerospace Engineering) Illinois Institute of Technology, 1982
B.S. (Mechanical Engineering) Illinois Institute of Technology, 1981

Principle Fields of Interest

Design, analysis, and 3D modeling of fluid, thermal, and energy systems; computational fluid dynamics and heat transfer; chemical engineering processes; energy conversion; fuel cells; energy conservation and management; combined heat and power; district heating and cooling; heating, ventilation, and air-conditioning; renewable energy; atmospheric physics and chemistry; aerosols-cloud-climate interactions; experimental data acquisition and analysis.

Employment

Employer	*Dates*
Australian College of Kuwait	
Professor of Mechanical Engineering	2016 - 2021
The American University of Iraq, Sulaimani	
Professor and Founding Chair of Engineering	2013 - 2016
Texas A&M University, Kingsville	
Professor of Mechanical and Industrial Engineering	1998 - 2013
Associate Professor of Mechanical and Industrial Engineering	1992 - 1998
Assistant Professor of Mechanical and Industrial Engineering	1988 - 1992
Illinois Institute of Technology	
Instructor of Mechanical Engineering	1986 - 1988
Sargent & Lundy Engineers	
Engineering Analyst	1985 - 1987

Organization Memberships

American Society of Mechanical Engineers
American Society of Heating, Refrigerating, and Air-Conditioning Engineers
American Geophysical Union
Pi Tau Sigma Fraternity

Professional Registration

Registered as Professional Engineer, State of Texas # 67415.

Certificates and Awards Received

Harvard University, Graduate School of Education: Certificate of Achievement – Leaders of Learning, 2019
Texas A&M, Kingsville, Service Award, 2008
ASHRAE, Certificate of Appreciation, 2001
ASHRAE, Appreciation for Contributions to Educational Excellence, 2001
ASHRAE, Presidential Award of Excellence, President South Texas Chapter, 1995
ASHRAE, Student Chapter Outstanding Mechanical Engineering Faculty Award, 1994

Teaching

Australian College of Kuwait

Undergraduate
Graduation Project, Thermodynamics, Air Conditioning, Fluid Mechanics.

The American University of Iraq, Sulaimani

Undergraduate
Capstone Design, Thermodynamics, Fluid Mechanics, Heat Transfer, Engineering Laboratory.

Texas A&M University-Kingsville

Undergraduate
Air Conditioning, Gas Dynamics, Computational Methods, Heat Transfer, Application of Thermodynamics, Chemical Thermodynamics, Thermodynamics, Mechanical Engineering Laboratory, Engineering Measurements, Computer Based Graphics and Design.

Graduate
Turbulence, Advanced Fluid Mechanics, Conduction and Convection Heat Transfer, Radiation Heat Transfer, Advanced Thermodynamics, Thermodynamics of the Atmosphere, Finite Element Methods, Numerical Methods, Thesis, Graduate Research Project.

Illinois Institute of Technology

Undergraduate
Design of Thermal Systems, Fluid Mechanics, Mechanics of Solids II (Strength of Materials), Mechanics of Solids I (Statics).

University Service

Organization	*Dates*
Australian College of Kuwait	
Departmental	
Graduate Projects Coordinator	2017 - 2021
Chair of Research Committee	2017 - 2021
Chair of Laboratories Committee	2016 - 2017
The American University of Iraq, Sulaimani	
Institutional	
President of Faculty Senate	2014 - 2015

Departmental
Founding Chair of the Engineering Department 2013 - 2015

Texas A&M, Kingsville

Institutional
Executive Member of the Faculty Senate 2005 - 2006
Faculty Senator 2000 - 2013
Chair, Faculty Senate Ethics Committee 2003 - 2004
Chair, Scholarship Committee 2003 - 2004
Chair, Appeals Committee 2007 - 2008
Member, Regents Professor Service Award Committee 1997 - 2000
Member, Graduate Council Program Review Committee 2003 - 2004
Member, University Curriculum Committee 1993 - 1994
Member, Distinguished Service Award Committee 1998 - 1999
Member, Alumni Awards Committee 1998 - 2005
Member, Piper Award Committee 2000 - 2002
Member, Librarian Search Committee 1991 - 1992
Member, Promotion Appeals Committee 2000 - 2001
Member, Calendar Committee 1999 - 2001
Member, Student Grievance Committee 1990 - 1992

College of Engineering
Chair, College Promotion and Tenure Committee 2001 - 2002
Member, College Dean Search Committee 2007 - 2008
Member, College Curriculum Committee 1992 - 2013
Member, College Computer Usage Committee 1989 - 1991

Departmental
Graduate Coordinator 1989 - 1998
Chair, Curriculum Committee 1998 - 2013
Chair, Fellowship/Scholarship Committee 1998 - 2004
Member, Promotion and Tenure Committee 1992 - 2013
Member, Labs Committee 1991 - 1995
Member, Faculty Search Committee 1998 - 2013
Member, ABET Committee 2005 - 2013

Professional Service

Organization *Dates*

Texas Faculty Association
President of the Texas A&M, Kingsville Chapter 2009 - 2012

ASHRAE
Regional Vice Chair 1998 - 2001
President, South Texas Chapter 1995 - 1996
Chair, Educational Activities Committee, South Texas Chapter 1989 - 2013
Member, National Post-High School Committee 1998 - 2001
Member, National Grant Committee 1998 - 2001
Member, K through 12 National Committee 1998 - 2001
Member, Student Design Project National Committee 1998 - 2001
Student Chapter Advisor 1989 - 2013
Faculty Liaison 1989 - 2013
Founded the Student Chapter of ASHRAE 1989

GEAR UP Program

Faculty Fellow, AP Chemistry 2003 - 2004

Grants, Contracts and Fellowships

Granting Agency *Dates*

Pacific Northwest National Laboratory 2012
Impact of Trace Gases on Aerosol Activation

TAMUK Research Award 2012 - 2013
The Creation of Hybrid Discretization Model for Topology Design

U.S. Nuclear Regulatory Commission 2011 - 2013
Nuclear Education Curricula Development Grant

TAMUK College of Engineering Grant 2010
Spectrometer Equipment Grant

Pacific Northwest National Laboratory 2010
Aerosol Activation Review

Pacific Northwest National Laboratory 2009
Refinements and Extensions to Aerosol Activation Parameterization

U.S. Department of Energy and Argonne National Laboratory 2005
Meteorological Modeling, Air Quality, and Atmospheric Aerosols

NASA Modeling and Data Analysis Research Program 2000 - 2004
Aerosols, Clouds, Chemistry and Radiative Forcing

U.S. Department of Energy 1997 - 2000
Atmospheric Radiation Measurement Program

NASA EOS Program 1996 - 1999
Aerosols, Clouds, Chemistry and Radiative Forcing

National Science Foundation 1997 - 2000
Student development and life-long learning in engineering

U.S Department of Energy 1997
Industrial Assessment Center

Texas Railroad Commission 1997 - 1999
Testing of Propane Air Conditioner and Dehumidifier

Texas Railroad Commission 1995 - 1997
Testing of Propane Air Conditioner and Dehumidifier

Kubba Consultants, Inc. 1994 - 1995
Development of Environmental Compliance Software Package

U.S. Department of Energy 1992 - 1995
Summer Faculty Research Program,

College of Engineering at TAIU 1991
Flow in Curved Tubes

City of Harlingen, Texas 1990

Waste to Energy Recovery of Refuse as an Alternative to Landfill

Office of Sponsored Research at TAIU 1989
Thermal Economic Analysis of Cogenerated Refuse Incinerators

Summer Research Fellowships

Institution	*Dates*
Argonne National Laboratory Faculty and Students Team Program	2005
Pacific Northwest Laboratory Faculty Research Program	1994 & 1995
Lawrence Berkeley Laboratory Faculty Research Program	1992 & 1993

Consultation Activities

Client	*Dates*
Pacific Northwest Laboratory Aerosol-Cloud Interactions.	1995 - 2012
International Test and Balance, Inc. Compliance Procedures.	1999 – 2000
Kubba Consultants Development of Environmental Compliance Software Package	1994 - 1995

PUBLICATIONS

Ph.D. Dissertation
Abdul-Razzak, H., (1988). "Thermoeconomic Analysis of Cogenerated Refuse Energy Recovery Plant with Thermal Storage." *Illinois Institute of Technology*, Chicago, Illinois.

M.S. Thesis
Abdul-Razzak, H., (1982). "Thermal-Economic Analysis of Organic Rankine Combined Cogeneration Cycles." *Illinois Institute of Technology*, Chicago, Illinois.

Books
Abdul-Razzak, H., (2012). "Atmospheric Aerosols: Regional Characteristics." *INTECH*, (ISBN) 978-953-51-0728-6.

Papers in Refereed Journals

1. Abdul-Razzak, H., and Porter, R. (1995) "Thermoeconomic Optimization of Sensible Heat Thermal Storage for Cogenerated Waste-to-Energy Recovery." *ASME Journal of Engineering for Gas Turbines and Power*, Vol. 117.

2. Ghan, S., Leung, L., Easter, R., and Abdul-Razzak, H. (1997) "Prediction of Cloud Droplet Number in a General Circulation Model." *Journal of Geophysical Research*, Vol. 102.

3. Abdul-Razzak, H., Ghan, S., and Rivera-Carpio, C. (1998) "A Parameterization of Aerosol Activation, Part I: Single Aerosol Type." *Journal of Geophysical Research*, Vol 103.

4. Ghan, S., Guzman, G., and Abdul-Razzak, H. (1998) "Competition between Sea-salt and Sulfate Particles as Cloud Condensation Nuclei." *Journal of the Atmospheric Sciences*, Vol. 55.

5. Zhang, Y., Easter, R., Ghan, S., and Abdul-Razzak, H. (1999) "Impact of Aerosol Size Representations on Aerosol Modeling." *WIT Transactions on Ecology and the Environment*, Volume 37, DOI: 10.2495/AIR990951.

6. Abdul-Razzak, H., and Ghan, S. (2000) "A Parameterization of Aerosol Activation, Part II: Multiple Aerosol Types." *Journal of Geophysical Research*, Vol 105.

7. Ghan, S., Easter, R., Chapman, E., Abdul-Razzak, H., Zhang, H.Y., Leung, R., Laulainen, N., Saylor, R., and Zaveri, R. (2001) "A Physically-Based Estimate of Radiative Forcing by Anthropogenic Sulfate Aerosol." *Journal of Geophysical Research*, Vol. 106.

8. Nenes, A., Ghan, S., Abdul-Razzak, H., Chuang, P., and Seinfeld, J. (2001) "Kinetic Limitations on Droplet Formation." *Tellus*, Vol. 53B.

9. Zhang, H., Easter, R., Ghan, S., and Abdul-Razzak, H. (2002) "Impact of Aerosol Size Representations on Modeling Aerosol Cloud Interactions." *Journal of Geophysical Research*, Vol. 107.

10. Abdul-Razzak, H., and Ghan, S. (2002) "A Parameterization of Aerosol Activation, Part III: Sectional Representation." *Journal of Geophysical Research*, Vol. 107.

11. Easter, R., Ghan, S., Zhang, Y., Saylor, R., Chapman, E., Laulainen, N., Abdul-Razzak, H., Leung, L., Bian, X., and Zaveri, R. (2004) "MIRAGE: Model Description and Evaluation of Aerosols and Trace Gases." *Journal of Geophysical Research*, Vol. 109.

12. Abdul-Razzak, H., and Ghan, S. (2004) "Parameterization of the Influence of Organic Surfactants on Aerosol Activation." *Journal of Geophysical Research*, Vol. 109.

13. Abdul-Razzak, H., and Ghan, S. (2005) "Influence of Slightly Soluble Organics on Aerosol Activation." *Journal of Geophysical Research*, Vol. 110.

14. Jin, K., Abdul-Razzak, H., Elkassabgi, Y., Zhou, H. and Herrera, A. "Integrating the Theory of Constraints and Six Sigma in Manufacturing Process Improvement." *International Journal of Human and Social Sciences*, 4:16, 2009.

15. Ghan, S., Abdul-Razzak, H., Nenes, A., Ming, Y., Liu, X., Ovchinnikov, M., Shipway, B., Meskhidze, N., Xu, J., and Shi, X. (2011) "Droplet Nucleation: Physically-Based Parameterization and Comparative Evaluation." *Journal of Advances in Modeling Earth Systems*, Vol. 3, M10001, 33 pp. DOI: 10.1029/2011MS000074.

16. Isensee, G., and Abdul-Razzak, H. (2012) "Modeling and Analysis of a Diffuser Augmented Wind Turbine." *International Journal of Energy Sciences*, Vol. 2, Issue 3.

17. Riojas, J., Abdul-Razzak, H., and Kotamarthi, R. (2012) "Analyzing Mexico City's Air Quality Data to Better Understand the Sources, Sinks, and Chemical Modification of Black Carbon Aerosols." *The International Journal of Climate Change: Impacts and Responses*, Vol. 3, Issue 1.

Refereed Conference Proceedings

Hussam, W., Salem, H., Khanafer, K., Fadel, A., Khlefat, A., Abdul-Razzak, H. (2021) "Performance Evaluation of a Hybrid Solar Chimney-Photovoltaic Power Plant for Electricity Generation." *ASTFE Digital Library*, *Thermal and Fluids Engineering Conference*, pages 1293-1303, DOI: 10.1615/TFEC2021.sol.036227.

Yilmazer, N., Yilmaz, M., Nekovei, R., Ozcelik, S., and Abdul-Razzak, H. (2014) "Competition Driven Robot Design." *QScience Proceedings*, *World Congress on Engineering Education 2013*, Vol. 2014, http://dx.doi.org/10.5339/qproc.2014.wcee2013.29.

Abdul-Razzak, H., Elkassabgi, Y., Punati, P. K. and Nasser, N. (2009). "Analysis of Blood Flow in a Partially Blocked Bifurcated Blood Vessel." *American Institute of Physics Conference Proceedings*, Volume 1168, pp 119-122.

Jin, K., Abdul-Razzak, H., Elkassabgi, H., Zhou, H. and Herrera, A. (2009) "Integrating the Theory of Constraints and Six Sigma in Manufacturing Process Improvement." *Proceedings of World Academy of Science, Engineering and Technology*, Volume 49, P550-554, ISSN 2070-3724.

Zhang, Y., Easter, R., Ghan, S., and Abdul-Razzak, H. (2001) "Impact of Aerosol Size Representations on Modeling Aerosol Cloud Interactions." *Proceedings of the AWMA Conference on Regional Haze and Global Radiation*, Bend, Oregon.

Ghan, S., Easter, R., Chapman, E., Laulainen, N., Leung, R., Zaveri, R., Saylor, R., Zhang, Y., and Abdul-Razzak, H. (1999) "A Physically-Based Estimate of Aerosol Radiative Forcing by Anthropogenic Sulfur." *Proceedings of the American Geophysical Union Fall Meeting*, San Francisco, California.

Ghan, S., Abdul-Razzak, H., Nenes, A., Chuang, P. and Seinfeld, J. (1999) "Kinetic Limitations on Droplet Formation." *American Association for Aerosol Research 18th Annual Conference*, Tacoma, Washington.

Abdul-Razzak, H. and Rivera-Carpio, C. (1993) "The Fraction of Activation of the Water-Soluble Aerosol Population." *Proceedings of the American Geophysical Union Fall Meeting*, San Francisco, California.

Abdul-Razzak, H. and Porter, R. (1988) "Thermal Storage in Waste-to-Energy Facilities for Meeting Peak Steam Loads." *Proceedings of the American Power Conference*, Chicago, Illinois.

Technical Reports

Abdul-Razzak, H. and Rivera-Carpio, C. "Atmospheric Cloud Physics Simulation System, Adiabatic Expansion Model: A User's Guide." Energy and Environment Division, Lawrence Berkeley Laboratory, Berkeley, California, 1992.

SCHOLARLY ACTIVITY

Report Presentations

Thomas, C., Abdul-Razzak, H., and Kotamarthi, R. (2005) "Meteorological Modeling of Mexico City." Presented at Argonne National Laboratory.

Riojas, J., Abdul-Razzak, H., and Kotamarthi, R. (2005). "Analyzing Mexico City's Air Quality Data to Better Understand the Sources, Sinks, and Chemical Modification of Black Carbon Aerosols." Presented at Argonne National Laboratory.

Riojas, R., Abdul-Razzak, H., and Kotamarthi, R. (2005) "Aerosol Activation: Theoretical Predictions versus Observations." Presented at Argonne National Laboratory.

Ghan, S., and Abdul-Razzak, H. (2002) "Parameterizations of Aerosol Activation in GCMs.", Presented at a Round Table on the Aerosol-Cloud-Radiation Interaction in Boundary Layer Clouds, Meteo-France Conference Center, Toulouse, France.

Zhang, Y., Easter, R., Ghan, S., and Abdul-Razzak, H. (2002) "Impact of Aerosol Size Representations on Modeling Aerosol-Cloud Interactions." Presented at the GCSS/ARM Workshop, Kananaskis, Alberta, Canada.

Easter, R., Ghan, S., Chapman, E., Laulainen, N., Leung, R., Zaveri, R., Saylor, R., Zhang, Y., Abdul-Razzak, H., Wagener, R., Nemesure, S., and Hudson, J. (2000) "Evaluation of Aerosols, Direct and Indirect Forcing in a Global Aerosol and Climate Model." Presented at the 4th Workshop on the Northern Regional Climate Model, Toronto, Canada.

Ghan, S., Easter, R., Chapman, E., Leung, R., Laulainen, N., Abdul-Razzak, H., Saylor, R., and Zhang, Y. (1999) "A Physically-Based Model Estimate of Direct and Indirect Radiative Forcing by Anthropogenic Aerosols." Presented at the Global Aerosol Workshop, Meribal, France.

Ghan, S., Easter, R., Chapman, E., Laulainen, N., Leung, R., Zaveri, R., Saylor, R., Zhang, Y., and Abdul-Razzak, H. (1999) "Use of Satellite Measurements to Evaluate Physically Based Models of Aerosol Radiative Forcing." Presented at the NASA Earth Observed System Investigators Working Group Meeting, Vail, Colorado.

Abdul-Razzak, H., and Zhang, J. (1999) "Experimental Research on the Coefficient of Performance of an Engine-Driven Gas Heat Pump (Final Report)." Reported to Texas Rail Road Commission, Presented at the Department of Mechanical and Industrial Engineering, Texas A&M University-Kingsville, Kingsville, Texas.

Easter, R., Ghan, S., Laulainen, N., Wagener, R., Nemesure, S., Zhang, Y., Saylor, R., Chapman, E., Leung, R., Peters, L., Zaveri, R., and Abdul-Razzak, H. (1998) "Use of Surface and Satellite Measurements to Evaluate Global Model Simulations of Aerosol Optical Depth." Presented at the NASA/EOS/Investigators Working Group Meeting, Durham, New Hampshire.

Abdul-Razzak, H., and Abu-Zama, M. (1997) "Performance Characterization of an Engine-Driven Propane Gas Heat Pump (Progress Report)." Reported to Texas Rail Road Commission, Presented at the Department of Mechanical and Industrial Engineering, Texas A&M University-Kingsville, Kingsville, Texas.

Abdul-Razzak, H. (1993) "Atmospheric Aerosols and Global Warming." Presented at ASHRAE South Texas Chapter, Corpus Christi, Texas.

Abdul-Razzak, H. (1993) "Parameterization of Cloud Condensation Nuclei." Presented at Lawrence Berkeley Laboratory, Berkeley, California.

Abdul-Razzak, H. (1994) "ABET's Requirement for Integrated Curricula and Design." Presented at College of Engineering – TAMUK, Kingsville, Texas.

Abdul-Razzak, H. (1990) "Waste-to-Energy Recovery of Refuse as an Alternative to Landfill in Harlingen." Reported to City of Harlingen, Presented at City Hall, Harlingen, Texas.

Abdul-Razzak, H. (1990) "Performance and Cost of Modular Incinerator Plants." Reported to City of Harlingen, Presented at City Hall, Harlingen, Texas.

Abdul-Razzak, H. (1990) "Alternate Energy Prices for Waste-to-Energy Feasibility Studies." Reported to City of Harlingen, Presented at City Hall, Harlingen, Texas.

Master's Degree Thesis/Projects Directed

Krishna, Vikram (2011) "Hydrodynamic Analysis of Tension Leg Platform for Offshore Floating Wind Turbine"

Krishna, Vanam (2010) “Aerodynamic Characteristics of Wind Turbine blade”

Bheri, Madhu (2010) “Analysis of Oblique Shock Waves for Supersonic Waves Past a Wedge”

Indroju, Shilpa (2010) “Modeling and Simulation of Polymer Electrolyte Fuel Cell”

Akkanapragada, Sirisha (2010) “Modeling and Analysis of a Solid Oxide Fuel Cell”

Merugu, Praneeth (2010) “Modeling and Analysis of a Proton Exchange Membrane Fuel Cell”

Koganti, Sree (2010) “Impact of Operation Conditions on Performance of Wind Turbines”

Hari, Sri (2010) “Optimization of Shell and Tube Heat Exchanger”

Isensee, Grady (2010) “Modeling and Analysis of a Diffuser Augmented Wind Turbine”

Mustafa, Ali (2009) “Modeling and Analysis of NACA 4412 Airfoil to Maximize Lift and to Optimize Lift-to-Drag Ratio”

Puranik, Ameya (2008) “Analysis of Heat Flow Through Double Pipe Heat Exchanger”

Punati, Pavan (2008) “Analysis of Blood Flow in a Partially Blocked Bifurcated Blood Vessel”

Madella, Varsha (2007) “Numerical Investigation of Laminar Natural Convection in Vertical Isothermal Channel with Symmetric Surface Mounted Rectangular Ribs”

Hashmi, Syed Zainulabidin (2006) “CFD Analysis of Wind Pressure Over a House”

Emani, Vijaya (2006) “Computational Analysis of Multiphase Flow in a Helical Water-Oil Separator”

Vulisi, Durga (2006) “Numerical Simulation and Analysis of Fluid Flow in Computer Disk Drives”

Mohammed, Ahmed (2006) “Aerosol Activation: Predictions Versus Observations”

Kuppa, Vishalakshi (2005) “Longitudinal Ventilation in Highway Tunnels”

Areepitak, Trachu (2004) “Water-Oil Separator Modeling”

Ahmad, Sarkar (2003) “Numerical Analysis of Two Phase Flow Through Well Head Choke”

Hannan, Mohammad (2003) “Flow Analysis Through an Inlet and Exit Valve of an Internal Combustion Engine”

Booher, Liam (2001) “Engine Surges in T-45 Goshawk”

Alam, Mohammad (2000) “Turbulent Flow in a Transition Duct”

Rahman, Rezaur (2000) “Numerical Analysis of a Shell and Tube Heat Exchanger”

Rahman, Mohammad (2000) “Turbulent Flow and Heat Transfer in a Mixing Elbow”

Zhang, Jingmei (1999) “Experimental Research on the C.O.P. of an Engine-Driven Gas Heat Pump”

Abu-Zama, Mohammad (1997) “Performance Characterization of an Engine-Driven Gas Heat Pump”

Al-Ajji, Fawzi (1997) “An Overview of the Design and Construction of Gas Transmission Pipelines”

Lozano, Lorene (1997) “Effect of Load Variations on Humidity”

Karnik, Amol (1996) “Study of Flow in Curved Tubes Using Finite Element Methods”

Babber, Harendra (1995) “Flange Design and Analysis”

Abdul Mannan, Mohammad (1994) “Flow in Curved Tubes”

Choudhury, Lutful Haq (1993) “Atmospheric Aerosols and Cloud Formation”

PERSONAL DETAILS

Citizenship:	United States of America
Date of Birth:	May 5, 1959
Marital Status:	Married
Children:	Four, ages 26, 30, 34, and 36