# Nooram Anjum

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#### EDUCATION **Texas Technological University** Texas, USA Doctor of Philosophy - Chemical Engineering; GPA: 4.0/4.0 Aug 2020 - Aug 2025 Courses: Advanced Thermodynamics, Fluid Transport Principles, Reaction Kinetics, Advanced Chemical Engg Techniques, Computation Advisor: Dr. Chau Chyun Chen, Professor of Chemical Engineering, TTU Aligarh Muslim University Aligarh, India Master of Technology - Chemical Engineering; GPA: 9.2/10.0 (Rank 2/50) Aug 2017 - Aug 2019 Courses: Chemical Reaction Engineering, Advanced Thermodynamics, Fluid Mechanics, Process Modeling and Simulation, Optimization Thesis: Modeling and Simulation of Hollow Fibre Biocatalyst Membrane Reactor Advisor: Dr. Mohd. Danish, Professor of Chemical Engineering, AMU Aligarh Muslim University Aligarh, India Bachelor of Technology - Chemical Engineering; GPA: 7.7/10.0 Aug 2013 - Aug 2017 Thesis: Production of Penicillin-G by Penicillium chrysogenum Advisor: Dr. Sattar Hussain, Professor of Chemical Engineering, AMU EXPERIENCE Argonne National Lab, USA Visiting student - Graduate Advisor: Dr. Meltem Urgun-Demirtas, Principal Environmental Engineer April 2023 - present Project: Membrane Separation for Organic acid solution • Investigation: Thermodynamically modeled and critically analyzed the phase equilibria of associating mixtures like methanol & diethylamine. • Coursework: Pursued courses on process intensification, process safety & modular processing. Summer Intern **RAPID** Manufacturing Institute for Process Intensification, AIChE, USA Advisor: Keith Joseph, Senior Education Specialist June 2022 - August 2022 Project: Modeling phase equilibria of associating mixtures - Double Azeotropy • Investigation: Thermodynamically modeled and critically analyzed the phase equilibria of associating mixtures like methanol & diethylamine. • Coursework: Pursued courses on process intensification, process safety & modular processing. Texas Technological University, USA Graduate Research Assistant Supervisor: Dr. Chau Chyun Chen, Prof of Chem Engg, TTU Jan 2021 - Present Project: Polyazeotropy in binary mixtures • Investigation: Thermodynamically investigated the occurrence of multiple azeotrope formation of a set of binary systems consisting of interacting mixtures like primary alcohol and secondary amines, ammonia and hydrofluorocarbons, isobutyl acetate and ethanoic acid. • Implementation: Implemented Non-random two liquid (NRTL) model with Wertheim's association theory. • Validation: Simulated results are compared with experimental data for various binary systems. • Presentation : Paper accepted at the Annual AICHE Fall meeting 2022 to held in Phoenix, USA. Texas Technological University, USA Teaching Assistant Instructor: Dr. Priya Gill, Professor of Chem Engg, TTU Jan 2021 - Aug 2021 • Planning: Planned the coursework, assignments, pitches on *Entrepreneurship* for 30 students. • **Supervision and Evaluation**: Supervised and evaluated the performance of the students in the exams. Indian Institute of Technology, Bombay, India Graduate Summer Intern Supervisor: Dr. RM Thaokar, Professor of Chem Engg, IIT-B June 2018 - Aug 2018 Project: Separation of water from water in oil emulsion using electro-coalescence • Experimentation: Conducted experiments to determine the optimum way of separating water from a water in oil emulsion by applying electric field to the sample. • Investigation: Studied the effects on separation of various factors like increasing values of continuous electric field, introducing modulating signal, change in duty cycle, application of insulating layer and compared the initial separation rates for each case. Aligarh Muslim University, India Graduate Research Assistant Supervisor: Dr. Mohd. Danish, Prof of Chem Engg, AMU Aug 2018 - June 2019 Project: Modeling and Simulation of Hollow Fibre Biocatalyst Membrane Reactor

• **Mathematical modeling**: Developed a mathematical model for a Hollow Fibre Biocatalyst Membrane Reactor where reactions are carried out in the presence of enzymes immobilized in a spongy catalytic region for arbitrary reactions.

• Application: Simulated the model developed on Mathematica and investigated various real-life industrial cases.

• Publications: Papers presented at the 7th International Conference on Advances in Energy Research, Department of Energy Science and Engineering, IIT Bombay and Second International Conference on Chemistry, Industry and Environment, Department of Applied Chemistry, AMU, India

Oil and Natural Gas Cooperation, Dehradun, India Supervisor: Mr. K.A. Siddiqui, Chief Engineer, ONGC

Project: Natural gas processing at Hazira power plant

- Plant working: Studied the working and implementation of various types of unit operations and processes involved in the processing of natural gas obtained after drilling at Hazira power plant.
- Failure analysis: Studied the failures occurring in oil extraction processes.

### OTHER ACADEMIC PROJECTS

Bachelor thesis on Production of Penicillin-G by Penicillium chrysogenum AMU, India Supervisor: Dr. Sattar Hussain, Professor of Chem Engg, AMU Aug 2016 - June 2017

- Plant designing: Designed the plant for production and recovery of Penicillin-G concerning all intermediate unit operations and processes.
- Safety analysis: Performed detailed analysis of process mechanical designing, safety economic aspects of equipments.

### Independent Project on Space-Time Block Coding

- Supervisor: Ms. Sarah Anjum, Professor of Electrical Eng., AMU Aug 2016 - June 2017
  - Wireless networking: Performed simulation of Space-time block codes in SIMULINK for wireless networks.
  - Investigation: Adopted different modulation schemes to check the performance of the system via Bit Error Rate Vs signal to noise ratio.
  - Publication E: Paper presented in International Conference on Electrical & Electronics Engineering, World Research Forum for Engineers and Researchers, Pune, India. Published in IOSR Journal of Electronics and Communication Engg.

## Independent Project on Arduino Based Decade Counter

- Supervisor: Ms. Sarah Anjum, Professor of Electrical Engg, AMU
  - Circuit construction: Constructed a 0 to 9 counter circuit using Arduino UNO.
  - Arduino programming: Implement the code using Arduino IDE which can be multiplexed to run different symbols.
  - Publication 🖻: Paper published in IOSR Journal of Electronics and Communication Engineering.

#### Awards and Scholarships

- Recipient of Sir Syed Excellence in Science Award by AMU Alumni Association of New England, United States for outstanding performance in academics and research. (2018)
- Recipient of Postgraduate Student Scholarship 96,000 INR (US 1340 dollars) a year. (2017, 2018)
- Selected for Graduate Summer Research Internship at IIT Bombay with US 220 dollars a month. (2018)
- Selected for Summer Internship at Oil and Natural Gas Cooperation, Dehradun. (2016)
- Recipient of AMUL India scholarship for scoring highest possible CGPA in Class X. (2010)

#### LEADERSHIP ROLES

- Mentor at the Society for Advancing Gender Equity in STEM at University of Texas, Austin.
- Secretary of Chemical Engineering Graduate Student Association, Texas Technological University, USA •
- Session Organizer at the Twenty-First Symposium on Thermophysical Properties, Boulder, USA
- Core Organizer of Annual Engineering College Festival, Aligarh Muslim University, India
- Participant in Reform nation organized in Technical Festival at Indian Institute of Technology, Bombay, India
- Secretary of Society of Chemical Engineering Student Chapter, Aligarh Muslim University, India

#### **Memberships**

American Institute of Chemical Engineers (AIChE), Texas Tech University, Institute of Electrical and Electronics Engineering (IEEE), American Physical Society (APS), International Association of Hydrogen Energy (IAHE)

#### Workshops attended

- Summer Workshop on molecular dynamics (MD), Texas Tech University, USA
- Annual training for high performance computing, Texas Tech University, USA
- National workshop on "Modeling and Simulation in Chemical Engineering and Allied Fields" under TEQIP, India
- Week long workshop on Web Development organized by Institute of Electrical and Electronics Engineers, AMU, India
- Software training programme on PDMS organized by SAChES, AMU, India
- Workshop on "Big Data and Data Analysis" conducted by M/s. Tata Consultancy Services, India

Summer Trainee June 2016 - Aug 2016

AMU, India

AMU, India

Aug 2016 - Nov 2017

- Anjum, N., Oba, S., Hiaki, T., Hsieh, C.J. and Chen, C.C., 2024. Thermodynamic modeling of double azeotropy systems. *Fluid Phase Equilibria*, 578, p.113993.
- Hamid, U., Hsieh, C.J., Wu, H., Saberin, S., Anjum, N., Valentino, L., Urgun-Demirtas, M. and Chen, C.C., 2023, November. Multicomponent Aqueous Phase Adsorption Equilibria of Organic Acids on Ion-Exchange Resin. In 2023 AIChE Annual Meeting, Phoenix, USA.
- 3. Anjum, N., Oba, S., Hiaki, T. and Chen, C.C., 2022, November. Polyazeotropy for Binary Mixtures: Methanol and Diethylamine. In 2022 AIChE Annual Meeting. AIChE.
- 4. Anjum, N., Oba S., Hiaki T., Chen C., 2022. Polyazeotropy for Binary Mixtures: Methanol and Diethylamine, at the RAPID Reception and Poster Session, *AIChE Annual Meeting, Phoenix, USA*.
- Anjum, N., Danish M., Anjum. S., 2019. Modelling and Simulation of Hollow Fibre Biocatalyst Membrane Reactor, in 7th International Conference on Advances in Energy Research, Department of Energy Science and Engineering, IIT Bombay, India.
- Anjum, N., Danish M., Anjum. S., 2019. Modelling and Simulation of Hollow Fibre Biocatalyst Membrane Reactor, in Faiz Mohammad (ed.)., Second International Conference on Chemistry, Industry and Environment, Department of Applied Chemistry, AMU, India, pp. 103.
- Anjum, N., Anjum. S., 2018. Arduino based Decade Counter, in S. G. Bari, L. Patil, R. S. Kothe (eds.)., International Conference on Electrical and Electronics Engineering, World Research Forum for Engineers and Researchers, Pune, India, pp. 89 – 91
- Anjum, N., Anjum. S., 2017. Space-Time Block Coding. IOSR Journal of Electronics and Communication Engineering, 12(5), 46 - 53.

### SKILLS SUMMARY

- $\circ~$  Technical: C, MATLAB, Mathematica, ASPEN GUI version 10.0, ANSYS, Microsoft Office, Python, HPC, MD simulations,  $\mbox{IAT}_{\rm E} X$
- **Instruments**: Confocal microscope, Rheometer, Waveform generator, High voltage amplifier, Heat exchangers, Distillation columns, Batch reactors, CSTRS, PFRS, Packed and Fluidized bed reactor
- $\circ~$  Languages: English, Hindi, Urdu