

# Mohsen Dirbaz

Chicago, Illinois, US

Interview Availability: 1 week notice

Start Availability: Jun 2025

Education: Ph.D. Chemical Engineering / M.S. Natural Gas Engineering / B.Sc. Petroleum Engineering

Last Position: Postdoctoral Fellow, University of Missouri-Columbia

Work Authorization: Green Card

## Candidate Overview / Highlighted Skills

- A well-rounded Chemical Engineer with 5+ years in-depth knowledge of process design, modeling, and simulation in oil & gas industries, ASPEN Plus, HYSYS, PFD's, P&ID's, and heat and material balances.
- Strong background in process design, modeling, and simulation with previous experience in process engineering and familiarity with primary unit operations and auxiliary production equipment align well with the requirements of the position.
- His strong academic background, technical skills, and practical experience make him a strong candidate for the role, and his proactive, self-motivated, and detail-oriented nature ensures that he can contribute effectively as an individual or as part of a team.
- In terms of professional experience, Mohsen worked as a Process Engineer at L&T Technology Services Limited, where he was involved in reviewing PFDs and P&IDs, fluid flow calculations, and liaison with suppliers and manufacturers. He also interned at Didas International Group, gaining hands-on experience in flare treatment technologies, silica processing, and economic impact analysis.
- Mohsen's technical skills include proficiency in key software tools like Aspen Plus, HYSYS, MATLAB, Python, and Full Stack Development (JavaScript), enabling him to perform advanced simulations and data analysis. He also has experience in designing gas processing units, including cryogenic air separation, acid gas sweetening, dehydration, and fractionation.
- Mohsen's track record includes numerous honors and awards, such as being named Teaching Assistant of the Year at IIT and receiving Graduate Assistantships during his academic pursuits. He has actively contributed to the academic community as President of the Graduate Student Association at IIT's ChBE department and has been a member of professional organizations like AIChE and SPE.

## Education

**Illinois Institute of Technology (IIT), Chicago, IL, USA**

Ph.D. in Chemical Engineering - GPA: 3.6 (2012-2020)

- Dissertation: "A Neural Network Based Model for Biomass Gasification in Fluidized bed"
- Conducted research on biomass and coal gasification, mercury removal, H<sub>2</sub>S removal, desulfurization, COS hydrolysis, and carbon capture technologies that support and improve the technical feasibility and economics of IGCC plants for power generation and chemicals production.
- Conducted research on environmental implications of hydraulic fracturing in shale gas and frac wastewater treatment technologies.

## Texas A&M University-Kingsville (TAMUK), TX, USA

M.S. Natural Gas Engineering - GPA: 3.9 (2010-2012)

- Dissertation: "Evaluation of Formation Damage in Horizontally Fractured Wells in Low Permeability Reservoirs"
- Designed advanced gas processing units such as cryogenic air separation, acid gas sweetening, dehydration, deethanizer, and fractionation in HYSYS.
- Performed detailed calculations of an 1800-mile pipeline natural gas transmission project including compression stations and optimization.
- Conducted research on subsea well completion, rheology of cementitious material, and enhanced oil recovery (EOR) methods including steam-assisted gravity drainage.

Sharif University of Technology (SUT), Tehran, Iran B.Sc. in  
Petroleum Engineering (2005-2010)

- Experience in PVT (reservoir fluids) lab, drilling lab, reservoir rock, and fluid mechanics lab.
- Performed experiments including constant composition expansion and constant volume depletion.

## Experience

University of Missouri-Columbia (2023–2025)  
Postdoctoral Fellow

- Studied the feasibility of manufacturing Nitrogen trifluoride ( $\text{NF}_3$ ), a critical material used by semiconductor foundries for wafer etching and chamber cleaning (Techno-Economic Analysis).
- Developed TEA Space, a platform that facilitates comprehensive techno-economic assessments (TEA) by integrating dynamic modeling and simulation capabilities. The system features a highly customiz-able interface, enabling users to modify various parameters and assess their impact on the financial performance of projects.
- Publication: "Optimally Dispersed Network of Biomass Gasification to Produce Green Hydrogen"
  - $\text{NH}_3$  Report:
    - \* Gray Haber-Bosch Process. Advanced Blue Processes.
    - \* Carbon Capture Technologies. Hydrogen Transportation and Storage Options.
    - \* Green Ammonia via Electrochemical Synthesis. Lithium Mediated Ammonia Production.
  - $\text{H}_2$  Report:
    - \* Hydrogen Production Routes. Electrolysis. Fossil Resources. Biomass.
    - \* Hydrogen Powered Fleet. Expansion Strategies and Market Penetration.
    - \* Biomass Carbon Neutrality and Circular Economy Life Cycle Assessment.

Didas International Group/Iran (2020–2023) Energy  
Initiatives Consultancy

- Flare Treatment Technologies / Regulatory Compliance.
- Silica Processing and End Use Optimization for Solar Thermal Applications, Reflective Coatings and Batteries and Energy Storage.
- The Impact of Euro Adoption on the GDP Dynamics of Middle Eastern Countries: Evidence from World Bank Data and WTO.
- Investigating the Systemic Disparity of Training-Deployment in Engineering Education in US.

Larsen and Toubro Technology Services Limited (2019) Process Engineer

- Reviewing PFDs (Process Flow Diagrams) and P&IDs (Process and Instrumentation Diagrams).
- Reviewing fluid flow calculations.
- Verifying as-built documents on-site.
- Presenting 30%, 60%, and 90% reports to clients.
- Acting as liaison between offshore engineers and clients.
- Contacting suppliers and manufacturers to discuss heat exchanger and pump specifications.

Illinois Institute of Technology (2015–2017)  
Teaching Assistant

- Served as Teaching Assistant in Process Design, Fluid Mechanics, and Thermodynamics, designing class assignments, and leading small group discussions, and provided training on HYSYS software to undergraduate students as part of the CAPSTONE Projects. Lectured on Process Equipment Sizing of compressors, pumps, heat exchangers, distillation columns, separators, reactors, etc.

Didas International Group/Iran (2009–2010)  
Internship

- Provided ongoing technical support to customers and helped to prepare and present technical reports and presentations for internal and external meetings.

## Honors and Awards

- Recipient of Teaching Assistant of the Year Award at IIT (2016 & 2017).
- Recipient of Graduate Assistantship, Illinois Institute of Technology, Fall 2012.
- Recipient of Graduate Assistantship, University of Texas A&M-Kingsville, Fall 2010.
- Recipient of Full Scholarship, Sharif University of Technology, Fall 2005.

## Affiliations

- President of Graduate Student Association at ChBE department, IIT (2016-2017).
- AIChE member (2014-2018).
- Society of Petroleum Engineers (SPE) (2010-2012).
- Representative of petroleum engineering students at SUT (2005-2010).
- Member of executive student committee of the 2nd and 3rd HSE conference (2009-2010).