

Abhishek Dwivedi, PhD
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Languages: English, Hindi, Spanish

Education	University	Year	CGPA (10 point)
M-Tech+Ph.D. Dual degree (Chemical Engineering)	Indian Institute of Technology (IIT) Bombay, Mumbai, India	2014- 2020	9.4
B.Tech. (Chemical Engineering)	Rajiv Gandhi Institute of Petroleum Technology (RGIPT), Jais, Amethi, India	2008- 2012	7.97

Scholastic Achievements

- Secured All India Rank 4 (**Percentile: 99.97**) in **Graduate Aptitude Test in Engineering (GATE) 2014 (Chemical Engineering)**
- Qualified **IIT-JEE 2008** with an All India Rank 7360 (**Percentile: 97.64**)
- Received **Letters of Appreciation** for being the **Branch Topper** of consecutive semesters, **6th (C.G.P.A.-9.45/10)** and **7th (C.G.P.A.-9.25/10)**, and for doing exceptionally well in the **5th (C.G.P.A.-8.86/10)** semester in **B-Tech**

Work Experience Summary

- Completed eight industrial projects during PhD and post-doctoral fellowship for different organizations including a Government of Canada organization (NRCan), Suncor Energy, Gujarat State Petroleum Corporation Ltd. (GSPL) etc.
- Assistant professor, NIT Rourkela, Odisha, India (April, 2023 – present)
- Postdoctoral fellow, University of Alberta (April, 2021 – April, 2023) (Duration: 2 years)
- Research Associate, IIT-Bombay (May, 2020 – Mar, 2021) (Duration: 10 months)
- Management Trainee-Process, Bharat Oman Refineries Ltd (BORL), M.P., India (May, 2012 – Nov, 2013) (Duration: 1 year 5 months)

Post-Doctoral Work

Institution: University of Alberta, Canada

Apr 2021 – Apr 2023

Research Focus: Process design and techno-economic analysis of biofuel production/combustion processes & biogenic CO₂ valorization primarily for National Resources Canada (NRCan, a government of Canada organization) and Suncor Energy

Supervisor: Prof. Amit Kumar, **University of Alberta**, Canada

PhD Thesis

Institution: Indian Institute of Technology Bombay

July 2014 – Mar 2020

Program: M-Tech+PhD dual degree (under co-advised PhD programme with Washington University in St. Louis)

Thesis Title: Advanced Process Design and Intensification for CO₂ valorization

Supervisor: Prof. Ravindra Gudi, IIT Bombay

Co-Supervisor: Prof. Pratim Biswas, Washington University in St. Louis, US

Research Focus: Process development and optimization for CO₂ valorization

Peer Reviewed International Journal Publications

- Khan, F. M., **Dwivedi, A.**, Rosha, P., & Kumar, A. (2026). Strategic valorization of biogenic CO₂ from kraft pulp mills. *Journal of Cleaner Production*, 554, 148107.
- Pankhedkar, N., Sunkara, S., **Dwivedi, A.**, Gudi, R., Biswas, P., & Bhargava, S. (2025). Analysis of biomass as a feedstock in a chemical looping-based polygeneration process for CO₂ valorization. *The Canadian Journal of Chemical Engineering*, 103(8), 3568-3588.
- Pankhedkar, N.[#], **Dwivedi, A.**[#], Gudi, R., and Biswas, P. (2022). ‘Intensified Chemical Looping Combustion Based Polygeneration for CO₂ Valorization to Value-Added Chemicals (Methanol and DME)’, *Industrial & Engineering Chemistry Research*, ACS publications, 61(32), p. 11861-11879, <https://doi.org/10.1021/acs.iecr.2c01339> ([#] Equal first author contribution)
- **Dwivedi, A.**, Gudi, R. and Biswas, P. (2021) ‘An improved water electrolysis and oxy-fuel combustion coupled tri-reforming process for methanol production and CO₂ valorization’, *Journal of Environmental Chemical Engineering*. Elsevier, 9(1), p. 105041. doi:2022 <https://doi.org/10.1016/j.jece.2021.105041>
- **Dwivedi, A.**, Gudi, R. and Biswas, P. (2020) ‘An Oxy-fuel Combustion Based Tri-reforming Coupled Methanol Production Process with Improved Hydrogen Utilization’, *International Journal of Greenhouse Gas Control*, Elsevier, 93 (2020), p. 102905, <https://doi.org/10.1016/j.ijggc.2019.102905>
- **Dwivedi, A.**, Gudi, R. and Biswas, P. (2018) ‘Oxy-fuel combustion based enhancement of the tri-reforming coupled methanol production process for CO₂ valorization’, *Journal of CO₂ Utilization*. Elsevier, 24 (2018), p. 376–385, 10.1016/j.jcou.2018.01.023
- **Dwivedi, A.**, Gudi, R. and Biswas, P. (2017) ‘An improved tri-reforming based methanol production process for enhanced CO₂ valorization’, *International Journal of Hydrogen Energy*. Elsevier, 42 (36), p. 23227–23241, 10.1016/j.ijhydene.2017.07.166.

Awards

- “**Best Paper Presentation Award**” for a paper titled “Modelling And Optimization Of An Intensified Water Electrolysis Integrated Tri-Reforming Coupled Methanol Production Process”, Akash A.G., Nimish Pankhedkar, Rahul Patel, Ashish Sahoo, **Abhishek Dwivedi**, and Ravindra Gudi, at the International Conference on Civil, Environmental and Applied Sciences (ICCEAS-2025), organized by the Department of Civil Engineering and Basic Science & Humanities, Gandhi Institute for Education and Technology, Baniatangi, during 18 - 19 July, 2025 (**Students under my supervision in this paper: Akash A.G. (M-Tech) and Ashish Sahoo (B-Tech+ M-Tech Dual degree)**)
- Awarded the **MAGEEP Research Scholarship** (McDonnell Global Energy and Environment Partnership) for pursuing research in Washington University in St. Louis, US as a visiting researcher and working under a co-advised PhD programme with Prof. Pratim Biswas

Industrial Consultancy Projects (during postdoc)

- Contributed (for Suncor Energy) to a project titled “Study on estimation of biogenic CO₂ emissions and capture cost in Canada” (Authors: **Dwivedi, A.**, Khan, F., Mukherjee, A., Kumar, A.)” July 2022 – Dec 2022

- Contributed (for Suncor Energy) to a project titled “The assessment of agricultural residue availability and potential for conversion to biofuels in Canada” (Authors: Billal, M.M., **Dwivedi, A.**, Mukherjee, A., Kumar, A.)”
June 2022 – Nov 2022
- Contributed (for NRCan) to a project titled “Study to provide an overview of bioenergy with carbon capture and storage technologies including assessing supply chains” (Authors: Oni, A.O., **Dwivedi, A.**, Mahbub, N., Meza, B., Kumar, A.)”
Apr 2022 – Sept 2022
- Contributed (for NRCan) to a project titled “The role of biomass feedstocks in clean fuels markets” (Authors: Gemechu, E., Davis, M., Giwa, T., **Dwivedi, A.**, Haider, M., Sebastian, R., & Kumar, A.)” Oct 2021 – Mar 2022

Visiting Researcher at WUSTL

Worked as a **Visiting Research Associate** at **Washington University in St. Louis (WUSTL)** under the co-advised PhD program

Jan 2018 – July 2018

Research Focus: Worked on process development and optimization for CO₂ valorization under my PhD co-supervisor Prof. Pratim Biswas, Department of Energy, Environmental and Chemical Engineering, WUSTL

Industrial Consultancy Projects during PhD

- Completed a project titled “Identification and mitigation of flow malfunction in compressed natural gas network” for **Gujarat State Petroleum Corporation Ltd., India**
Jan 2020 – Feb 2020
 - Conducted simulations to model and assess the valve flow dynamics for problem identification
 - Identified gas hydrate formation as the reason for valve malfunction and suggested ways for mitigation
- Completed a project titled “Process development: Natural gas liquid valorization” for **Greenville LNG, Nigeria**
Jan 2020 – May 2020
 - Explored, evaluated and proposed various process schemes for natural gas liquids valorization
 - Designed a blending station for natural gas liquids and oxygenate admixture for gasoline blend production
- Completed a project titled “Evaluating operability of LNG processing plant at Rumuji” for **Greenville LNG, Nigeria**
Jan 2018 – Aug 2018
 - Evaluated the viability of the LNG processing plant via process simulations
 - Designed a de-butanizer column for improving the composition of LNG
- Completed a project titled “Identification of an optimal pathway for sodium fluoride waste stream valorization” for **Euro Multivision Ltd., India**
Mar 2016 – July 2016
 - Developed novel reaction schemes to valorize waste sodium fluoride stream
 - Preliminary level economic evaluation done to identify potential optimal pathway

Industrial Experience

Bharat Oman Refineries Limited, Bina, MP- A BPCL & Oman Oil Company Joint Venture

May 2012 - Nov 2013

Responsibilities

- Optimizing operation of MS Blending unit to maintain maximum production & minimum quality giveaway with Blend Property Controller (BPC), Blend Ratio Controller (BRC) & Online NIR Analyzers.
- Operated MS Blending unit during commissioning of Blend Property Controller (BPC) & Online NIR Analyzers and coordinated with the commissioning team for optimum operation of the unit.
- Worked on YOKOGAWA CS 3000 DCS platform handling production of Motor Spirit, uninterrupted crude & intermediate feedstock supply for process units. Involvement in Startups and Emergency shutdowns.
- Preparation of daily performance report related to MS blending, material balance and equipment status report.

Courses Developed

- Developed the course titled “**Life Cycle Assessment for Process Systems**” for M-Tech students in NIT Rourkela
- Developed the course titled “**Optimization Algorithms for Engineering Applications**” for M-Tech students in NIT Rourkela

Reviewed International Journal Publication

- Reviewed an international journal (SCI Expanded Journal) paper for “**Chemical Engineering Science**” in tri-reforming process area in **2021**.
- Reviewed an international journal (SCI Expanded Journal) paper for “**International Journal of Hydrogen Energy**” in green hydrogen production area in **2021**.
- Reviewed an international journal (SCI Expanded Journal) paper for “**Environmental Technology & Innovation**” in methanol production via renewable energy area in **2021**.
- Reviewed an international journal (SCI Expanded Journal) paper for “**Journal of Taiwan Institute of Chemical Engineers**” in tri-reforming process area in **2018**.

Peer Reviewed International Conferences

- Akash A.G., Nimish Pankhedkar, Rahul Patel, Ashish Sahoo, **Abhishek Dwivedi***, and Ravindra Gudi (2025). "Modelling and Optimization of an intensified water electrolysis integrated tri-reforming coupled methanol production process." **In E3S Web of Conferences**, vol. 648, p. 03003. EDP Sciences. <https://doi.org/10.1051/e3sconf/202564803003> (*as a supervisor and corresponding author)
- **Dwivedi, A.**, Gudi, R. and Biswas, P. (2016) ‘Sensitivity based optimization of the tri-reforming based CO₂ valorization process’, 11th IFAC Symposium on Dynamics and Control of Process Systems including Biosystems, DYCOPS-CAB 2016, June 6th-8th, Trondheim, Norway, IFAC-PapersOnLine, 49(7), pp. 359–364. doi: 10.1016/j.ifacol.2016.07.362.
- **Dwivedi, A.**, Biswas, P. and Gudi, R. (2017) ‘Coupling Oxy-fuel Combustion Process to Tri-reforming based Methanol Production Process for CO₂ Valorization’, in 20th Conference on Process Integration, Modelling and Optimization for Energy Saving and Pollution Reduction (PRES’17), 21-24th August, Tianjin, China
- **Dwivedi, A.**, Biswas, P. and Gudi, R. (2017) ‘Preliminary Level Comparison of CAMERE Process and Tri-reforming Coupled Methanol Production Process for CO₂ Valorization Application’, in 20th Conference on

International Conference Presentations

- Billal, M. M., **Dwivedi, A.**, & Kumar, A. (2023). The development of a new GIS-based optimization model for multi-feedstock and multi-product biomass supply chain, 31st European Biomass Conference and Exhibition (EUBCE), June 5th-9th, Bologna, Italy
- **Dwivedi, A.**, Khan, F., & Kumar, A. (2022). Development of a valorization framework for biogenic CO₂ emissions from kraft pulp mills, Canadian Chemical Engineering Conference (CCEC 2022), Oct 23rd-26th, Vancouver, Canada.
- Nayan, N., **Dwivedi, A.**, Akbari, M., & Kumar, A. (2022). Renewable Jet fuel production through Alcohol to Jet pathways from lignocellulosic biomass, 30th EUBCE - European Biomass Conference & Exhibition, 9th-12th May, Held Online.
- Billal, M. M., **Dwivedi, A.**, Sebastian, R., & Kumar, A. (2022). A GIS-based optimization model for multi-feedstock biomass supply chain for multi-product generation through integrated biorefineries, 2022 ASABE Annual International Meeting, July 17th-20th, Houston, Texas.
- Nayan, N., **Dwivedi, A.**, Akbari, M., & Kumar, A. (2022). Assessment of bio-jet fuel production from alcohols, Canadian Chemical Engineering Conference (CCEC 2022), Oct 23rd-26th, Vancouver, Canada.

Workshops/Symposiums

- Conducted a **National level SERB sponsored workshop** titled “Process modelling of thermochemical processes for the conversion of biomass to bio-fuels [PTPCBB-2024]” from 11th to 17th March, 2024 in NIT Rourkela.
- Conducted a two-day workshop on “Optimization of Chemical Process using Aspen Plus” for B-Tech students of IIT Bombay as organized by **Azeotropy Chemical Engineering Association** in 2017
- Conducted a workshop on DWSIM (chemical process simulator) and HINT (process heat integration software) in **Azeotropy 2017**, IIT Bombay’s Chemical Engineering Symposium
- Delivered a presentation on the topic “Development of a CO₂ valorization process: The need of the hour” in a symposium titled “Technological Innovation and Entrepreneurship” conducted by **Hindustan Petroleum Corporation Limited (HPCL)**
- Attended a 12 day GIAN (Global Initiative for Academic Networks) course (2019) on “Advanced Coal Utilization: Current Status and Future Prospects” by Prof. Sankar Bhattacharya (Department of Chemical Engineering, Monash University) at IIT Kanpur

National Conference

- **Dwivedi, A.**, Saini, K., Meena, L., Kumar, R., “Comparison of reactive distillation & conventional process for methyl acetate production: modeling and simulation” National conference on recent advances in chemical and environmental engineering (RACEE-2012), 20th -21st Jan-2012, NIT Rourkela, Odisha, India