ABHINANDAN MOHANTY

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PhD research scholar at the Department of Chemical Engineering, IIT Roorkee. I am particularly interested in interdisciplinary research that leverages both experimental and computational skills to address challenges in chemical engineering domain.

EDUCATIONAL QUALIFICATIONS:

Course / Exam	Institution	Marks
PhD in Chemical Engg. (Jan 2026-Present)	Indian Institute of Technology, Roorkee, Uttarakhand	-
Integrated MTech in Chemical Engg. (August 2019-July 2024)	Institute of Chemical Technology, Mumbai - Indian Oil Campus, Bhubaneswar, Odisha	8.62 CGPA
AISSCE (2019)	Mother's Public School, Bhubaneswar, Odisha	85.4 %
AISSE (2017)	Modern Public School, Balasore, Odisha	10 CGPA

WORK EXPERIENCE / FELLOWSHIP:

GIET University | Gunupur, Odisha | Assistant professor   Aug 2024-Oct 2025

Indian Oil R&D Centre | Faridabad, Haryana | Research Intern   July 2023-Oct 2023
- Rheological studies of graphene-HDPE nanocomposites (TTS, FT-LAOS) using **AresG2** rheometer.
- Operated **thermal characterization** instrument: DSC.
- Performed polymer characterization ASTM tests: Xylene soluble, MFI, Izod, Tensile, Flammability, HDT, Vicat.

Indian Institute of Petroleum | Dehradun, Uttarakhand | Project Intern   Dec 2022-Feb 2023
- Synthesised 3 oil soluble **dispersed catalysts** for VR upgradation by hydrocracking.
- Performed their **characterization** using TGA.
- Operated **slurry phase batch reactor** at high temperature and pressure (420℃, 150 bar).
- Analysed product quality using various ASTM methods.

Indian Oil Refinery | Mathura, Uttar Pradesh | Vocational Trainee   June 2022-July 2022
- Developed an excel sheet to assess performance of 6 **heat exchangers** in VBU.
- Proposed a **macro enabled excel** model which suggests cleaning when fouling is high (30% drop).
- Briefly overviewed **FCC unit** and the catalyst loss from cyclones.

Paradeep Phosphates Limited | Paradeep, Odisha | Summer Intern   Mar 2022-May 2022
- Gained experience working in a **Phosphoric acid plant**.
- Prepared material and energy balance of three **evaporators**.

Millennium Fellowship Class of 2021 (with MCN and UNAI)   Aug 2021-Dec 2021
- Worked on a project titled "Cyber for Climate" aiming at bringing positive social change following UN SDGs.
- Build a Chrome Extension that calculates user's resultant carbon emission from internet usage.

ICT-IOC campus | Bhubaneswar, Odisha | Intern-online   Oct 2020-Jan 2021
- Application of **AI in Chemical Engineering**. Mentor: P. Ramanathan, Sr. Director, Capgemini.
- Collected various datasets in Chemical Engineering domain and performed **data analysis**, cleaning and visualisation using **python**.
- Applied **Machine Learning** algorithms using **Scikit learn and TensorFlow** libraries.

PROJECTS:

- Master's Thesis: Ultrasensitive detection of Arsenic in water using on-chip graphene-based sensors: Fabrication of LIG and decoration of iron oxide nanoparticles using solar irradiation, followed by square wave anodic stripping electrochemical testing. (Sept 2023-July 2024)
- Layout optimization of 50 wind turbines in a windfarm to Maximize Energy Output by reducing wake effect, using Genetic Algorithm in python. (Affiliated with Shell.ai)
- Preparation of flowsheet, and modelling of distillation column in DWSIM using CAPE-OPEN library. Optimization of flowrate, temperature, and product composition by performing Sensitivity Analysis.
- CFD simulation of solidification profile of steel using ANSYS FLUENT. (Affiliated with Steellun, NIT, Rourkela)
- Energy optimization through pinch analysis of Heat Exchanger Network using ASPEN Energy Analyzer

PUBLICATIONS:

Journal of Materials Chemistry B.; Ultrasensitive detection of arsenic in water using laser-scribed graphene-based electrodes; Accepted: May 2025. (Impact factor 6.1)

COMPUTER KNOWLEDGE:

- Python
- MS Excel
- MATLAB
- DWSIM
- C, C++
- Machine Learning

CERTIFICATIONS:

- Computers, Waves, Simulations: A practical introduction to numerical methods using Python (Coursera online: LMU Munich, Germany); Issued Sep 2020. Credential ID: F9PP25FM7ARJ
- Simulation and modelling of natural processes (Coursera online: University of Geneva, Switzerland); Issued Sep 2020. Credential ID: YGKVUCEXLLF8

ACHIEVEMENTS AND AWARDS:

- Qualified **GATE 2025**.
- Semi-finalist in EY Techathon for solution on Covid-19 vaccine distribution – 2021.
- Winner (public vote) in Shell.ai Hackathon for sustainable and affordable energy – 2020.
- Second position in Beat the Base contest by BVCOE, New Delhi – 2020.
- Champions award (Ultimate Metallurgist) in EDGE 2020 by Steellun NIT, Rourkela – 2020.

LANGUAGES:

English, Hindi, Odia