



Saransh Vottery
Chemical Engineering
Indian Institute of Technology Bombay

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B.Tech.
Gender: Male
DOB: 31/07/2004

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2026	
Intermediate	MP Board	KKV English Medium School	2022	94.00%
Matriculation	MP Board	KKV English Medium School	2020	98.67%

Pursuing **Honors** in Chemical Engineering department along with **Minor** degree in **C-MInDS** IIT Bombay

SCHOLASTIC ACHIEVEMENTS

- Bagged **Undergraduate Research Award 01 (URA 01)** by IIT Bombay for exceptional research work ['24]
- Ranked **10th** academically out of **140+** students in the Department of Chemical Engineering, IIT Bombay ['24]
- Secured **9th rank** in MP state merit list with **98.67%** marks in **10th** boards among **0.95** million students ['20]
- Secured a percentile of **99.08** in JEE Mains examination among 1 million+ candidates across the country ['22]

INDUSTRIAL EXPERIENCE

Internship | Zydus Lifesciences Limited

[May'24 - July '24]

Process Engineering department | Zydus Lifesciences Limited, Ambernath

- Mapped **15+ API** to **50+** reactors as per the annual demand ensuring maximum overall production efficiency
- Employed **Quality by Design** principles to increase API yield by **10%** by varying process parameters in lab
- Designed Batch Distillation column and determined overall process economics for a **solvent recovery** process
- Achieved enhanced layer separation by finding optimum composition of a mixture, increasing API yield by **24%**

RESEARCH EXPERIENCE

TAP Theory: Going Beyond the Standard Diffusion Curve | Research Project

[May'24 - Aug'24]

Guide: Prof. A K Suresh, Prof. Sonali Das, Prof. J R Picardo | Department of Chemical Engineering, IIT Bombay

- Reviewed **15+** research papers to study TAP experiment for characterizing gas-solid interactions in catalyst bed
- Conducted **10+** simulations in python for concentration and flux profiles in a TAP reactor in various conditions
- Formulated and solved governing equations using **advanced numerical methods** for multiple transport cases

LDH-based catalyst synthesis for CO₂ utilization | Research Project

[Aug'24 - Present]

Guide: Prof. Sonali Das | Department of Chemical Engineering, IIT Bombay

- Synthesized Layered Double Hydroxide (LDH)-based catalysts using co-precipitation method for CO₂ utilization
- Characterized catalysts by techniques such as **XRD, TPDRO** to determine structural and surface properties
- Investigated catalytic efficiency by reaction studies, analyzing metrics such as CO₂ **conversion** and **selectivity**

Algorithm for Detecting Carbonates on Mars | Research Project

[Jan'24 - Aug'24]

*Received an **LoR** from Prof. Alok Porwal | Centre of Studies in Resources Engineering, IIT Bombay*

- Developed a novel automated algorithm to detect carbonate minerals on Mars using data from **CRISM images**
- Employed techniques such as **Savitzky-Golay filter, continuum removal**, etc. in the pre-processing part
- Examined spectra of **20+** minerals to find features that distinguish carbonate spectrum from other minerals
- Submitted a research paper on the proposed algorithm, accepted at **IEEE Whispers 2024**, Helsinki, Finland.

TECHNICAL PROJECTS

Direct Air Capture | Team ChemEcube

[Feb '24 - Present]

An 8-member team creating sustainable solutions to real-world challenges | Guide: Prof. Mahesh S Tirumkudulu

- Contested with **38 international universities** in the **AICHE** competition to create a **1-ft cube** mini plant
- Engineering a **scalable model** to capture CO₂ from ambient air (**400 ppm** conc.) and isolate it in pure form
- Utilizing **Zeolite 13X** and its modifications to achieve adsorption capacity of **0.4 mmol CO₂/gm** of adsorbent

Course on Wheels 7.0 | Academic Project

[Dec '24 - Present]

Guide: Prof. Sanjay M Mahajani | Department of Chemical Engineering, IIT Bombay

- Conducted an extensive study of plant operations by visiting **25+** plants of **14+** chemical industries in Gujarat
- Preparing comprehensive report on DMCC's sulphuric acid, boric acid and speciality chemical plant operations
- Gained **insights** on heat and mass integration, waste management, quality control, ETP and ZLD of the plants

Digitalizing Protocol to Determine Reaction Kinetics | Course Project [Feb '24 - May'24]

Guide: Prof. Sanjay M Mahajani | Department of Chemical Engineering, IIT Bombay

- Worked in a team of **5** to perform **10+** experiments for determining kinetics of ester hydrolysis reaction digitally
- Designed an **Arduino-UNO** based pH detection system and utilized **Excel Macros** to automate data analysis

Computational Physics | Seasons of Code [May '23 - Aug'23]

Web and Coding Club | IIT Bombay

- Implemented **10+** numerical methods for solving differential equations associated with different physical systems
- Employed numerical techniques such as **profiling, vectorization** etc. to achieve faster and accurate solutions
- Simulated Fluid Flow by solving Navier Stokes equation using **python, matplotlib** in pipe and cavity systems

Netweaver | Winter In Data Science [Dec '23 - Jan'24]

Analytics Club | IIT Bombay

- Designed and implemented **neural network** from scratch using **Numpy** and **Matplotlib** libraries in Python
- Trained the neural network extensively on the **MNIST Dataset**, encompassing **50K+** handwritten digits
- Developed in-depth understanding of fundamental **machine learning** concepts and their versatile applications

Climate Finance | Finsearch [June '23 - Aug'23]

Finance Club | IIT Bombay

- Conducted in-depth research on climate change's **financial impacts** on various companies of different sectors
- Analyzed **annual reports** and sustainability disclosures of **10+** companies to assess their climate-related risks
- Generated **practical strategies** for companies to tackle climate risks and leverage sustainable opportunities

Equity Research | NoBias [Aug '23 - Sep'23]

Finance Club | IIT Bombay

- Prepared a comprehensive presentation of the **Fundamental** and **Business analysis** of **Sterling & Wilson**
- Crafted in-depth reports covering the **Corporate Governance**, **DCF valuation** and **Competitor Analysis**
- Among **10 Finalists** out of **80+** teams participated in the competition emphasizing credibility of the analysis

SoilFix | Course Project [Sep '23 - Nov'23]

Guide: Prof. Anu Narasimhan | Desai Sethi School of Entrepreneurship, IIT Bombay

- As a team of **6**, Ideated a venture as a part of an entrepreneurship course, dedicated to tackle **Soil Pollution**
- Found **bioremediation** as a viable solution by analysing research papers and examining real-world case studies
- Conducted Customer discovery interviews to gain insights into the needs and preferences of potential customers

POSITION OF RESPONSIBILITY

D-AMP Mentor | Department Academic Mentorship Program [May'24 - Present]

Selected as a part of a 41-membered team based on interviews and peer reviews to mentor 140+ students

- Appointed as a mentor to **6 sophomores** to guide them in their academic transition and personal endeavors
- Actively involved in **bridging the student-faculty gap** and improving the academic experience of students
- Providing counsel on a **1-1 basis** to ensure holistic development, helping them overcome personal challenges

KEY COURSES UNDERTAKEN

- **Chemical** : Chemical reaction & engineering, Heat & Mass transfer, Separation Processes, Chemical Eng. Thermodynamics, Introduction to Transport Phenomena, Process Fluid Mechanics, Numerical Analysis
- **STEM** : Calculus I, Calculus II, Linear Algebra, Differential Equations, Organic and Inorganic Chemistry, Physical Chemistry, Introduction to Quantum Mechanics, Introduction to Classical Physics
- **Programming** : Computer Programming & Utilization, AI & Data Science , Introduction to Machine Learning
- **Miscellaneous** : Introduction to Innovation and Entrepreneurship, Design thinking for Innovation, Economics, Makerspace, Biochemistry and Bioenergetics, Introduction to Philosophy, Environmental Studies

TECHNICAL SKILLS

- **Programming** : C/C++, Python (Numpy, Pandas, Matplotlib, Scipy, Scikit learn)
- **Softwares**: AutoCad, Fusion360, Desmos, Latex, Google Colab, Jupyter IDE, Canva, MS Excel

EXTRACURRICULAR ACTIVITIES

- Among **10** finalists in Equity Research competition conducted by Finance Club, IIT B among **90+** teams ['23]
- Won **Second prize** in inter-hostel group dance general championship 'Gyrations' among **10 teams** ['23]
- Volunteered for **Green Campus**, NSS implementing & promoting various environment friendly practices ['22]
- Won Intra school Annual general quiz competition for **3 consecutive years** among **300+** participants ['18-'20]
- Completed 4 week long **Consulting 101** course in Learnerspace conducted by UGAC ['23]