


AYUSHI GOYAL

Chemical Engineering | **Minor:** Industrial and Management Engineering

 [ayushi-goyal](#) |  [ayushig2000](#)
+91 - 9179697888 | ayushig@iitk.ac.in

EDUCATIONAL QUALIFICATIONS

Year	Degree	Institute	Performance
2018 – 2022	B. Tech (Chemical Engineering)	Indian Institute of Technology, Kanpur	8.74/10
2018	Class XII (CBSE)	R.K.V.M Higher Secondary School	93%
2016	Class X (CBSE)	Carmel Convent Senior Secondary School	10/10

INTERNSHIP EXPERIENCE

Data Analyst Intern at Dr. Reddy's Laboratories, Hyderabad

Jun'21 – July'21

Received **Pre-Placement Offer (PPO)** and **Letter of Recommendation (LOR)** for exceptional performance & valuable contribution to the company

Objective	• To develop a Process Analytical Tool in Python for qualitative and quantitative analysis of spectroscopic NIR data
Approach	• Pre-processed the data by using Savitzky-Golay filter and derivatives for reducing noise and baseline irregularities • Normalized the spectrum by utilizing SNV and MSC correction reducing scattering effects by outlier detection • Conducted Multi-Curve Resolution (MCR) analysis for determining the composition of each sample in a mixture • Implemented PCA algorithm for classification of samples by dimensionality reduction of multivariate data
Impact	• Developed a regression model using PLS , predicting the impurity present in a sample with an accuracy of 96% • Increased experiment efficiency by enabling automation of analysis, removing the requirement of multiple manual trials

SURGE 2020, IIT Kanpur | Mentor: Prof. Vishal Agarwal

Jun'20 – July'20

Objective	• To analyze the role of Zirconium Oxides in the hydrogenation of Carbon Dioxide on Copper surface to form Methanol
Approach	• Applied Density Functional Theory (DFT) + U model to examine the structure-activity relationship of ZrOx on Cu surface • Architected Cu slab and simulated structural energy optimization using highly accurate Quantum Mechanical calculations • Obtained the formation energy of various ZrO_x clusters using PBE functionals in the framework of Ab initio thermodynamics
Impact	• Development of better catalysts for industrial use, leading to reduced CO ₂ emissions and increased Methanol production

RESEARCH EXPERIENCE

Evaluation of modelling COVID-19 kinetics by using ML techniques & Neural Networks | Prof. Himanshu Sharma

Jan'21-Mar'21

- Predicted the number of infected patients using Linear Polynomial regression, compared the results with the pre-existing model
- Evaluated the pre-existing model with an accuracy of **94%** using **model evaluation techniques** such as RMSE, AUC-ROC and Cross-Validation
- Implemented **data augmentation** using **Keras** to increase the size of the minority class and pre-processed the plots using **OpenCV**
- Created and trained a **CNN** model using prior generated images of good/bad plots and classified them with an accuracy of **96%**

Portfolio Optimization using Markowitz Model | Prof. Suman Saurabh (Course Project), IME Dept, IIT Kanpur

Feb'21-Mar'21

- Identified the distribution and time series characterization of NIFTY50 data using **Shapiro Wilk Test** and **Chi-Square Statistics**
- Created a **Markowitz Portfolio** to give weights to the stocks and generated the **Efficient frontier** for the stocks
- Used **SML** to determine under/overpriced stocks, built a portfolio based on **Sharpe Ratio**, and tested it virtually

Binary Distillation Column | SimuTech Summer Project – Chemineer's Society, IIT Kanpur

Jun'19 – Jul'19

- Delineated a binary distillation column in **MATLAB**, employed the McCabe Thiele process to probe & draw conclusions from the process
- Automated the **Inspection Pipelines** to extricate the minimum number of stages and Reflux Ratio required to achieve separation
- Deliberated upon design considerations and software mileage for designing a distillation column using Aspen Hysys

TECHNICAL SKILLS

Programming Languages	Utilities	Python Libraries
Python, C, C++	MATLAB, VASP, Aspen-HYSYS, ASE-GUI, LATEX, Git, MS Office, Autodesk Inventor, Mendeley Desktop	NumPy, Pandas, Matplotlib, SciPy, Scikit-Learn, Keras, Seaborn

POSITIONS OF RESPONSIBILITY

Manager, Chemineer's Society, IIT Kanpur

Oct'20 – Apr'21

Leadership	• Led a two-tier team of 50+ students to manage numerous department events and encourage student participation
Work	• Facilitated conduction of various workshops on process simulators like Aspen HYSYS, MATLAB, COMSOL
Impact	• Collaborated with industries like Reliance, Tata Steel & Tata Chemicals for conducting talks and seminars

Organizer, Media and Publicity, Antaragni

May'20 – Oct'20

Leadership	• Headed a three-tier team of 30+ students responsible for publicity, content, and media associations worth INR 200k+
Work	• Carried out negotiations and associated with media companies like Dainik Bhaskar, ETV etc.
Impact	• Curated content and conducted events for social media handles, with an outreach of 50k+ viewers

RELEVANT COURSEWORK

*: Online Specialization

Numerical Methods in Engineering	Applied Probability and Statistics	Real Analysis and Multivariate Calculus
Linear Algebra & Ordinary Differential Equations	Data Structure and Algorithm	Introduction to Data science in Python*
Applied Plotting, Charting Data Representation*	Fundamentals of Computing	Applied Machine Learning in Python*

EXTRA CURRICULARS

Scholastic	• Awarded Certificate of Merit by AISCCE for being amongst the 0.1% of candidates to score 100/100 in Mathematics
Cultural	• Secretary, Media and Culture Council: Single-handedly overlooked the finances and logistics of various cultural events
Social Work	• Academic Mentor: Guided students facing academic troubles by conducting classes of CHM102 at an institute level