Rajat Daga | **170020009**
Chemical Engineering | **B.Tech.**
Indian Institute of Technology, Bombay | **Gender: Male**
DOB: 29-04-1999

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	[redacted]
Intermediate	CBSE	Delhi Public School, Vadodara	2017	[redacted]
Matriculation	CBSE	Delhi Public School, Vadodara	2015	[redacted]

Pursuing **Minor** in Systems and Control Engineering, IIT Bombay
Pursuing **Honors** in Chemical Engineering, IIT Bombay

SCHOLASTIC ACHIEVEMENTS

- Awarded **URA-01** (Under-Graduate Research Award) for successful research effort *[2019]*
- Awarded **AP** (top **6** students out of **140+** students) in Data Analysis course *[2019]*
- Placed among the **top 6** in the chemical engineering department out of **120+** students *[2019]*
- Secured All India Rank **1274** in Kishore Vaigyanik Protsahan Yojana (KVPY) *[2016]*
- Achieved All India Rank **1014** out of **0.2 million** candidates in IIT-JEE ADVANCED *[2017]*
- Procured All India Rank **1051** out of 1.2 million candidates in IIT-JEE MAINS *[2017]*

INDUSTRIAL EXPERIENCE

Summer Internship | Piramal Pharma Solutions *[May-July '20]*
Guide: Mr. Srinivasa Rao Korada

- Completed a **thorough study** of existing Effluent Treatment Plant operations at Piramal Ennore site
- Researched various **advanced alternative system** to enhance the effluent handling capacity of plant
- Prepared a detailed **operation cost calculation sheet** for MVR to juxtapose with vendor proposal
- Prepared a **detailed report** for the implementation of proposed equipment changes which would result in reduction of ETP operation cost upto **5%**

Overview of Indian Chemical Industry | Winter Course *[Dec '19 - Jan '20]*
Guide: Prof. Sanjay M. Mahajani

- Examined **10+** industrial sectors aimed to understand chemical processes implemented practically
- Discussed the role of technology, economics, and safety in **plant design** with leading industry experts belonging to 5+ sectors as part of interactive sessions
- Simulated Phenol production plant of Deepak Phenolics, Dahej using DWSIM; **determined working conditions** constrained to meeting technical and production specifications as part of a course project
- Documented a report on **Alkyl Amines** and **Deepak Phenolics**, detailing on Methylamine production process and Cumene, phenol plants respectively as part of a 3-member group project

KEY PROJECTS

Scale up from Lab to Commercial Production | In-Semester Project *[Mar-Jun '20]*
Guide: Prof. Sanjay M. Mahajani

*Worked in collaboration with NCL for a government project to design the **1st DME production facility** in India*

- Performed **Basic Engineering** for scale up of DME synthesis process from lab to commercial scale
- Conceptualised the **best feasible reactor** configuration for exothermic reactor design by performing exhaustive comparative studies and analytical calculations
- Developed **energy efficient PFD** from scratch and simulated it's steady state working conditions in Aspen in coordination with the stakeholders, **achieving desired purity** (99.2%) of DME in vapor product stream
- Scrutinized the **optimal working conditions** of the plant by doing a cost-performance analysis

Simulation of water-crude oil emulsion | Summer Project *[April '19-July '19]*
Guide: Prof. Rochish M. Thaokar

- Studied **population balance equation** and **discretization methods** to model water drops
- **Devoloped MATLAB** code to simulate the same in emulsion under constant electric field

Modeling and Simulation of Unit Operations | In-Semester Project *[Feb '19-Present]*
Guide: Prof. Kannan M. Moudgalya

- Researched techniques and methods used in designing unit operations for industrial operations
- Applied **Python** language in **DWSIM** software to model and simulate unit operations
- Designed a multi-equipment drying-oil production flowsheet on **DWSIM** software

Study of shape oscillations of 2-D drop | Summer Project *[April '19-July '19]*
Guide: Prof. Rochish M. Thaokar

- Studied **Boundary Integral Method** for Laplace equation to solve unsteady bernoulli equation
- Implemented **2D Green's function** properties and **Fredholm integral equation** of second kind to calculate dipole density distribution and vector velocity potential for a 2D drop
- Formulated equations to solve for velocity vector and subsequently shape of the 2D drop

Textbook Companion | FOSSEE Project *[Dec '18-Feb '19]*
Guide: Prof. Kannan M. Moudgalya

- Learned and employed **OpenModelica** software to model and simulated various problems
- Worked on all the solved problems of **Chemical Process Principles** Part I by O.A Hougen, Watson

Chain Reaction | Course Project *[Apr '18]*
Guide: Prof. Krishna S. Narayana

- Programmed a fully functional, 2-player, **C++ based** version of the mobile game in a team of 3
- Successfully implemented C++ classes, structure, multi-dimensional arrays and loops

TECHNICAL SKILLS

- **Programming Languages**: Python, C++, Java NetBeans, MySQL, HTML, MATLAB
- **Software**: Aspen Plus, DWSIM, MS Excel, AutoCAD, SolidWorks, OpenModelica

COURSES UNDERTAKEN

Mathematical Courses	Introduction to Data Analysis, Introduction to Numerical analysis, Differential equations I and II, Linear Algebra, Calculus
Core Courses	Process Plant Simulation, Chemical Processes, Process Economics, Process Equipment Selection, Chemical Reaction Engineering I & II, Thermodynamic I & II, Molecular Principles, Mass Transfer I & II, Heat Transfer, Process Control, State Estimation, Solid Mechanics, Advanced Transport Phenomena, Fluid Mechanics
Other Disciplinary Courses	Mathematical Structures, Signals and Feedback system, Linear and Non-Linear Systems, Adaptive Control Theory (Systems and Control Engineering) and Optimization models (Industrial Engineering and Operation Research)

POSITION OF RESPONSIBILITY

Department Academic Mentor *[April'19-Present]*
Awarded Special Mention as DAMP mentor for exemplary contribution to team

- Selected out of **90+** candidates after rigorous screening, peer reviews and interpersonal skills
- Counselling **10** department juniors to cope up with the academic pressure co-curricular pursuits
- Fostering **academic changes** to align curriculum with student interests in chemical department

Coordinator, Competitions and LYP | Mood Indigo *[May'18-Dec'18]*

- **Conceptualizing and Organizing** 7 Multi-city Competitions pan India thus increasing outreach
- **Inviting celebrities** for 'Face of Genre', a celebrity endorsement scheme for Dramatics genre
- **Revamped** the governing rules and regulations of various cultural styles
- Negotiating deals with cultural institutes to provide winners a platform to showcase their talent

EXTRA-CURRICULAR ACTIVITIES

Competitions

- Stood **1st** in ASPEN Workshop Competition conducted by Azeotropy, IIT Bombay *[2019]*
- Clinched **1st** position in Chem-O-Philia quiz conducted by Azeotropy, IIT Bombay in IITB Zone *[2020]*
- Runner-up in DWSIM workshop conducted by Azeotropy, IIT Bombay *[2020]*

Sports

- Secured Gold Medal and bestowed with the "Best Player" title in Inter Hostel carrom GC *[Aug '17]*
- Selected in National Sports Organization (NSO) cricket team of **30 out of 300 players** *[Aug '17]*
- Participated in Cricket/Badminton/Football **Inter-Hostel General Championship** *[Jan '18/ Aug '18/ Jan '20]*
- Participated in Freshie Cricket League in which our team stood **third** *[Apr '18]*

Culturals

- Performed in Inter-Hostel Street Play arcade in presence of **100+** audience *[Sep '17]*
- Acted in a short video which received special mention among **100+** videos *[Aug '17]*