PRANAV K VASU | **193020027**
Chemical Engineering | **M.Tech.**
Indian Institute of Technology, Bombay | **Gender: Male**
DOB: 09-08-1994

Examination	University	Institute	Year	CPI / %
Post Graduation	IIT Bombay	IIT Bombay	2021	9.32
Graduation	University Of Calicut	GEC Thrissur	2016	89.40%
Graduation Specialization: Chemical Engineering				
Intermediate	Kerala State Board	St Francis HSS Mattom	2012	97.66%
Matriculation	Kerala State Board	St Francis HSS Mattom	2010	100.00%

Scholastic Achievements

- Secured **10/10** SGPA in M Tech 2nd Semester, IIT Bombay. ['20]
- Ranked **top 5%** in Bachelor of Technology in Chemical Engineering – Calicut University, Kerala. ['16]
- Secured **top 2** percentile in GATE 2018 Chemical engineering among 15855 students. ['18]

Master's Thesis

Investigation of Bubble Induced Turbulence using Particle Image Velocimetry [*Jan'20-present*]

Guide: Prof. Partha Sarathi Goswami, Chemical Engineering, IIT Bombay

Motivation	▪ **Energy Budget** is an integral part of any chemical industry. ▪ Bubbles can suppress or augment the turbulence in a system which can improve its energy **efficiency**. ▪ Bubble induced Turbulence holds the Potential to **enhance** heat and mass transfer in chemical processes.
Current Work	▪ To study how the **bubble induced turbulence** changes with various flow parameters such as Reynold's stress, Fluid phase fluctuations, mixing in fluid phase etc. ▪ Investigation of the flow field arising from bubble injections using multi-phase simulations performed in **ANSYS FLUENT** Workbench. ▪ Surveyed literature on experimental data and numerical predictions of such flows. ▪ Interpretation of the **simulation** Results and explaining them with physical reasoning. ▪ Data processing using **MATLAB** Codes and Image Processing algorithms.
Future Work	▪ Performing **experiments** at higher Reynold's numbers using Designed Experimental Set-up. ▪ Explore how transition to higher Reynold's number will affect bubble **size, shape and trajectory**. ▪ Investigation of bubble **pinch-off** mechanism to control the bubble size distribution. ▪ Study on **Inhomogeneous** or Sheared Turbulence.

Industrial Exposure

Industrial Training at Bharat Petroleum Corporation Limited (BPCL); Kochi Refinery [*17 – 31st Aug'15*]

- Consulted with Learning and Development **(L&D)** team and participated in a spot quiz conducted.
- Visited major units of the refinery such as Fluidized Catalytic Cracking Unit **(FCCU),** Crude Distillation Unit **(CDU)** and Vacuum Distillation Unit **(VDU)** and studied through lectures, plant visits and discussion with operating teams.
- Underwent **Fire Protection** and **Safety Training** and equipment studies such as Heat Exchanger, Pumps and flow meters.

Industrial Training at Fertilizers and Chemicals Travancore Limited (FACT): [*05- 15 Sep'14*]

- Visited both Petrochemicals **(PD)** and Fertilizers **(UD)** division and inspected various aspects of safety in industries.
- Studied about major plants including the Replacement Ammonia Project **(RAP)**, **Waste Water Treatment** and visited **Pollution Control** department.

Professional Work Experience

Executive Associate | Syngene International Limited-BIOCON [*Jul'16-Jun'17*]

Major responsibilities	▪ Reviewed **Documentation** of Process Parameters and utility consumption- Production, Chemical Development ▪ Continuously monitored reaction conditions and process deviations in **DCS**. ▪ Validated **Audit Protocols** in Warehouse and reviewed **Vendor Documents** in consultation with HOD. ▪ Maintained **C-GMP** practices associated with **API,** for their purification and Extraction.

Positions of Responsibility

Department Coordinator | Institute Student Companion Program, IIT Bombay [*April '20-Present*]

- Leading a team of **7 Student Companions** to organise formal and informal sessions for **80** new entrants in the department to help them on academic and non-academic fronts.
- Worked in a team of **177** people and coordinated the **e-orientation** at the department level for **80** new entrants.
- Compiled and developed the department's Master's **handbook** in coordination with Student Companions.
- **Interviewed** candidates to select a team of 7 Student Companions for the department.
- **Mentoring 11** students throughout the year helping them on academic and non-academic fronts during Covid-19 pandemic.

Teaching Assistant | *Prof Sharad Bhartiya, IIT Bombay* [*Jan'20- Apr'20*]

- Served as TA for course CL 202 - **Data Analytics** and Interpretation.
- Contributed in evaluating submitted answer scripts of **140** students for quizzes and mid-semester examinations.
- Invigilated during conduction of quizzes.

Technical Projects and Seminar's

Manufacture of 150TPD Cumene by Q-Max Process | B Tech Project [*Jul'15-May'16*]

Guide: Prof. Dr Ranjana Devi B, Government Engineering College, Trichur

- Based on the **Q-Max** Zeolite Process, Material-Energy balances were carried out and performed Simulation in **Aspen Plus**.
- **Designed** Distillation Column and ancillaries, and analysed economic feasibility of the plant.
- Conducted Hazard and Environmental Analysis.

Comparative Analysis of Various Discretization and ODE-IVP Solver Methods | Course Project [*Aug'19-Nov'19*]

Guide: Prof. Mani Bhushan | Computational Methods in Chemical Engineering | IIT *Bombay*

- Developed **MATLAB** codes for solving 1D Transient Heat Conduction problem.
- The PDE-IVP was **discretised** in spatial direction using Finite Difference Approximation and Orthogonal Collocation.
- Solved using Runge Kutta 4th order and Euler's explicit algorithms, Compared the results and accuracy of the methods**.**

Heat Transfer enhancement through use of Nano-fluids using Helical Coil Heat-Exchanger | B Tech Seminar [*Jan'16-May'16*]

Guide: Prof. Dr Ranjana Devi B | Government *Engineering College, Trichur*

- Studied effect of nano particles (**CuO** and **Al_2O_3)** on heat transfer rates at different flow rate, concentration and temperature.
- Reviewed Significance among factors by analysing a **Factorial Design-**Design of Experiment-DOE.

CFD Studies on Flow through an Orifice Meter | Course Project [*Jan'20-Jun'20*]

Guide: Abhilash J Chandy | Essentials of Turbulence | IIT Bombay

- Literature review on **CFD** studies and a comparative assessment with experiments to predict pressure drop analysis.
- Validated sensitivity analysis in **K-ϵ turbulence** model.

Design of a Packed Bed Reactor for Cumene Production | Course Project [*Aug'19-Nov'19*]

Guide: Pramod P Wangikar | Advanced Chemical Reaction Engineering | IIT Bombay

- **Optimised** Pressure drop and Temperature by analysing variation in conversion of Cumene using **MATLAB** plots.
- Estimated **weight of catalyst** required for a production of 150 TPD of Cumene at 97% conversion.

Key Course's

Turbulent Multi-Phase flow, Product Research and Development, Computational Methods in Chemical Engineering.

System and Control	▪ Optimisation, Process Dynamics and Control, Process Instrumentation, Numerical Analysis.
Simulation	▪ Process Design Software Lab, Process Modeling and Simulation
Reaction Engineering	▪ Advanced Chemical Reaction Engineering, Petroleum Refinery Engineering
Miscellaneous	▪ Economics and Management of Chemical Industries, Mathematical and Statistical Methods, Project Engineering, Safety Engineering in Process Plants, Chemical Engineering Design.

Technical Skills

Attended 2 day **ANSYS Fluent** workshop held at NIT Calicut as a part of Chemical engineering symposium. ['15]

Software: ANSYS (CFX; Fluent), Aspen Plus, Hysys, MATLAB **Tools:** LaTeX, Image J, Image Pro, MS Office, C

Extra-Curricular Activities

Technical	▪ Secured **1st** prize in "CONCORSO"- A chemical engineering **quiz** competition conducted during THATHWA- An annual Techno-Management fest held at NIT Calicut	['15]
	▪ **1st** Position in '**Industrial Design Problem**' and 'Aavruth' held at NIT Calicut.	['16]
	▪ **3rd** Prize in 'Mad Chemistry' conducted during National **Level Multi-fest** 'Dyuthi'.	['13]
	▪ Member of Indian Institute of Chemical Engineers, student Chapter	['13-'16]
Cultural	▪ Secured **2nd** position in Essay Writing Competition (Malayalam and Sanskrit), Group Song and Patriotic Song in **Kerala School Kalotsavam** District Level.	['08-'11]
	▪ **1st** position in Aksharaslokam and Folk Song conducted during **Annual Cultural** meet 'Confluence' in Government Engineering College.	['16]
Miscellaneous	▪ Secured **2nd** position in Essay writing Competition held in connection with World Space week in association with Indian Space Research Organisation (**ISRO**).	['10]
	▪ Participated in 'Number Chart' category organised by District **Mathematics Club** Association.	['10]
	▪ Undergone a course on **Legal Literacy** Classes held by the Kerala State Legal Services.	['09]
	▪ Honored with 'Sanskriti Puraskar' for excellence in **Sanskrit.**	['12]
	▪ Member of **Gandhi** Peace Foundation.	['06-'09]