BISHWA RANJAN SI

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ACADEMIC QUALIFICATIONS

Degree/ Certificate	University/ School, City	Year	CGPA / %
BT-MT Dual degree, Chemical Engineering	Indian Institute of Technology Kanpur	2019	PG: 9.3, UG: 7.7
Class XII, CBSE	DAV Public School, Bhubaneswar	2013	93.80
Class X, CBSE	DAV Public School, Talcher	2011	10.0

M.TECH THESIS

Active Motion of Janus Particles in Complex Media (Thesis advisor: Prof. Rahul Mangal) *(ongoing)*

Aim	To study the active motion of Janus particles with the objective to produce directed motion
Analysis	• Prepared **Janus particles** by coating Pt onto monolayer of Silica micro-spheres using Thermal vapour deposition • Performed control experiments, tracked and tabulated their motion in static and shear flows in Newtonian medium • Analyse their motion and orientations in Complex medium both under static and shear flows

Active Motion in Emulsion Systems (Thesis advisor: Prof. Rahul Mangal) *(ongoing)*

Aim	To study the active motion of oil droplets in oil/water emulsion systems stabilised by surfactants
Analysis	• Designed a micro-fluidic device of PDMS for oil droplet generation in a T junction and studied the droplet sizes • Study active motion in stationary and shear flow conditions in both aqueous media and in polymeric suspensions

KEY ACADEMIC PROJECTS

Nano-photo catalysis for water purification *(Under Prof. R. Gupta)* *(Jan'17-Apr'17)*

Aim	To prepare a coating of **r-Graphene oxide/Graphene** on TiO2 nanofibers for better remediation of waste water
Analysis	• Prepared polydopamine coating on **TiO2** and Characterized the fibers using **TEM, SEM and FTIR** • Pyrolysis of nanofibers to convert polydopamine to r-Graphene oxide/Graphene in H2 and Ar atmosphere under appropriate conditions
Results	• **Raman spectroscopy** and **FTIR** showed Id/Ig ratio less than one indicating presence of Graphene/r-Graphene oxide

Analysis of powder formation in a CVD reactor *(Under Prof. N. Tiwari)* *(Aug'17-Nov'17)*

Aim	To prevent Si powder formation and obtain uniform film of Si on float glass in an Atmospheric Pressure CVD reactor
Analysis	• Modelled the thickness of film on glass at different temperatures and pressures in MATLAB • Analyzed the process in COMSOL Multiphysics for possible powder formation at different locations in the reactor

Process Design and Control of Acrylic Acid (AA) production plant *(Instructor: Prof. N. Kaistha)* *(Jul'17-Nov'17)*

Aim	To design a chemical plant producing AA with **purity of 99.5%** by catalytic oxidation of propene
Analysis	• Identified feasible process flowsheets and performed **Cost Optimisations** and **Heat integration** • Minimized duties and increased the annual profit by optimising **dominant design Degrees of Freedom** • Designed a **plant-wide control strategy** for AA production plant for 20% throughput fluctuations

INTERNSHIP

Azeotrophic Separation of Ethanol and water *(Ipca Laboratories Limited, Ratlam, M.P.)* *(May'17-May'17)*

Aim	To simulate a process for separation of water and ethanol azeotrope mixture using an entrainer
Analysis	• Studied the available distillation columns in the plant and recorded production data over a period • Simulated the process of purifying ethanol using cyclohexane as entrainer in **ASPEN PLUS** and optimized the process and design parameters

SCHOLASTIC ACHIEVEMENTS

- Secured **AIR-2167** (among **150,000** students) in **Joint Entrance Examination Advanced 2014**
- Outscored 1.3 million students appeared in **JEE Main 2014** with a percentile score of **99.55%**
- Secured All India **97.69** percentile in Class XII Board Examination

POSITIONS OF RESPONSIBILITY

Teaching Assistant (under Prof. S. Panda for Chemical Engineering Communication course) *(ongoing)*

- Organize self-introduction and group discussion sessions for a class of 80 students and provide them personal feedback
- Conduct guest lectures, presentations and grade the writing assignments

Academic Mentor (Counselling Service, IIT Kanpur) *(Aug'15-Apr'16)*

- Responsible for helping academically weak students in the course of LIF101 (Introduction to Biology)
- Prepared practice questionnaire for the students for semester exams and participated in hall level remedial classes

Assistant Coordinator (Simutech Club) *(May'16-Apr'17)*

- Jointly led a group of 30 students from different years of study in Department of Chemical Engg. for semester long projects
- Organized a 3-days-long MATLAB workshop for Chemical Engineering students

TECHNICAL SKILLS

Languages/Scripts: MATLAB | C | FORTRAN | HTML | Latex | Python
Software Experience: Aspen HYSYS | Aspen Plus | Ansys Fluent | COMSOL | Origin 9.1 | ImageJ | Inventor | Polymath

RELEVANT COURSES

Polymer Physics | Heat Transfer | Mass Transfer | Process Control | Chemical Engg. Design | Micro-electronic Fabrication | Intermolecular and Surface Forces | Chemical Reaction Engg. | Biochemical Engg. | Transport Phenomena | Thermodynamics

EXTRACURRICULAR ACTIVITIES

- Served as a **NCC Cadet** for one year, took active part in national events and participated in SLR shooting workshop
- Worked as **Assistant Manager, Hospitality Team** for the hospitality & accommodation of incoming participants in **Techkriti'16**
- Worked as **Secretary, Synchronicity**, **Antaragni'15 &** helped in smooth conduction of the competition at different tiers.
- Adjudged as the best team at the **State Level Environment & Mineral Awareness Programme** conducted by SGAT, Bhubaneswar