Aritra Roy
Mechanical Engineering
Indian Institute of Technology (ISM) Dhanbad
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Roll No.20JE0180
Male
UG Fifth Year (B.Tech.)
DOB: 30.10.2000

Examination	Affiliation	Institute	Year	GPA
Graduation(ongoing)	IIT Dhanbad	IIT Dhanbad	2025	8.99
Intermediate(+2)	ISC	Calcutta Boys' School, Kolkata	2019	91.1%
Matriculation	ICSE	Calcutta Boys' School, Kolkata	2017	90.0%

Pursuing **Bachelor of technology** in Mechanical Engineering with a Double Major Degree.

ACADEMIC ACHIEVEMENTS

- Secured an **All India Rank of 14111** in JEE (Advanced) among 6 Lakh candidates   (2020)
- Secured an **All India Rank of 385** in WBJEE among 90,000 candidates   (2020)
- **Dr. Goutam Mitra Memorial Award** in matriculation for scoring 100 in Mathematics at state level   (2017)

INTERNSHIPS

Summer Research Internship Programme (SRIP – 2023)   *Summer March'2023 (PUBLISHED)*
Indian Institute of Technology (ISM) Dhanbad, India   *Guide- Prof Soumyajit Sengupta |Research Project Intern*

- Designing a **fluidized bed reactor** for ammonia decomposition reaction
- Developing an empirical relationship between the fluidized velocity and the height of the fluidized bed reactor
- Before implementing in laboratory scale a simulation is performed on Asphen software to check the design aspects
- Experimental investigation about the optimization of the reactor so that it can be well experimented on laboratory scale

ONGC, Summer Industrial Training Programme   *Summer May'23*
Vasudhara Bhawan, Mumbai - 400051 , India   *Guide- Shri B K Rai (CGM- Mech)|Onsite - Field Intern*

- Understanding the operating procedure for off-shore maintenance service
- Developed an understanding of the centrifugal pumps and gas turbines used for transportation of oil from off-shore

Product Development Internship, NVCTI   *Summer Jul'2022*
Indian Institute of Technology (ISM) Dhanbad, India[1]   *Guide- Prof Ajit Kumar| Research Project Intern*

- This project includes incorporation of ML based algorithm for fault detection in fluid power system
- In this project a device has been developed that has HDMI panel which will display the status of the working fluid power system
- Also a robust digital twin simulation of the working prototype has been developed on Automation Studio software. The idea of fault detection had been implemented in the hardware and the experimental evidences were developed

Bharat Heavy Electricals Limited, Summer Internship Programme   *Summer Jul'2022*
Patratu, Jharkhand, India   Onsite *Field Intern*

- Understanding **power plant engineering**, along with installation and functioning of boilers
- *Field visits and experienced the robustness of Power plant additionally working of ESP and FGD*

National Thermal Power Corporation Limited, Summer Internship Programme   *Summer June'2022*
Patratu, Jharkhand, India   Onsite *Field Intern*

- Understanding basic functioning of **power plant and thermal engineering**
- *Getting to do field visits and experiencing the coal gasification technology to develop power 3x800 MW*

Bharat Coking Coal Limited, Coal India Limited Training Programme   *Summer May'2022*
Sinidih HEMM Workshop, Jharkhand, India   Onsite *Field Intern*

- Understanding basics of **heavy machinery engineering** and worked at engine shop
- Worked at the transmission section and had insights about automobile engineering

RESEARCH PROJECT

Extension of Boundary Integral Formulation for solving elliptic pdes   *Spring 2021 - 2023*
Indian Institute of Technology (ISM) Dhanbad, India[1]   *Guide- Prof Sandipan Kumar Das |Research Project*

- The project aims to generalize the Boundary Integral Method (BIM) for Navier stokes flows by reformulating the solution technique within the original framework.
- The **Boundary Integral Method** (BIM) is a powerful and efficient numerical technique for solving partial differential equations wherever it is applicable. Its main advantage is that **it reduces the dimensionality of the problem by one**. Another **strength of this method lies in its natural appositeness for complex geometries**.
  I am now trying to incorporate the same formulation in 2D for solving problems pertaining to elliptic pde and navier stokes Flow.

AWARDS

- **Piyush Dutta Innovation Award** for development of exhaust gas waste heat recovery system and converting it into electrical energy with the help of thermoelectric generators along with MPPT (Maximum Power Point Tracking) algorithm to maximize the power transmission, **NVCTI, IIT(ISM) Dhanbad** (2023)
- **Dr. Goutam Mitra Memorial Award** in matriculation for scoring 100 in Mathematics at state level (2017)
- **S N Bhatt Fellowship (TIFR – ICTS)** while working on isotropic turbulence in ocean dynamics of micro plastics using Direct Numerical simulation methodology under guidance of Prof Rama Govindarajan (2024)

CONFERENCES

- WORKSHOP AND HANDS-ON TRAINING ON GROUND WATER MODELLING SYSTEMS ON GMS SOFTWARE Organized by: **IIT(ISM) DHANBAD (DEPT. OF ENVIRONMENTAL ENGINEERING)** | Date: **Jun 2022**
- WORKSHOP ON HPC FOR COMPUTATIONAL FLUID DYNAMICS(CFD) APPLICATIONS Organized by: **IIT BOMBAY, C-DAC, NSM (GOVT. OF INDIA)** | Date: **May 2022**
- WORKSHOP ON STAGING SYSTEM AND MECHANISM FOR LAUNCH VEHICLES Organized by: **ALIGARH MUSLIM UNIVERSITY (ZAKIR HUSSAIN COLLEGE OF ENGINEERING)** | Date: **Jan 2022**
- WORKSHOP ON PROPULSION SYSTEM FOR HYBRID VEHICLES Organized by: **IIT(ISM) DHANBAD** | Date: **Sep 2021**
- WORKSHOP ON HPC FOR ASTRONOMY AND ASTROPHYSICS Organized by: **IIT KHARAGPUR, NSM (GOVT. OF INDIA)** | Date: **Sep 2021**

TECHNICAL SKILLS

Programming	**Fluent** in C++/C, Python, MATLAB, FORTRAN
	Familiar with Hydraulic & Pneumatic Circuit Design in Automation Studio and Simulink
ML Toolkits	Keras, TensorFlow
Software	AutoCAD, SolidWorks, Ansys Fluent, Matlab

POSITIONS OF RESPONSIBILITY

MENTOR
BFX-NVCTI (IIT ISM) -Python Programming and Robotics, **Fall 2020**
- Selected to teach a class of over 200 young candidates at school level and to train them at national level

COURSES UNDERTAKEN

Mechanical (Core)	Engineering Thermodynamics, Theory of Machines, Design of Machine Elements, Hydraulics and Fluid Power System, Manufacturing Technology, IC Engines, Engineering Materials, Mechanics of Solid, Automobile Engineering, Fluid Mechanics, Production Engineering.
Mechanical (Special)[1]	Finite Element Method, Finite Element in Thermal Engineering, Computer Aided Manufacturing and Robotics.
Mathematics	Advanced Engineering Mathematics, Numerical Methods
Mining Machinery	Bulk Material Handling, Mineral Beneficiation Equipment, Automation and Control in Mining Machineries.
Others	Machine Learning (Coursera - Andrew NG, Stanford University), Industrial Robotics and Automation (TexMin – IITISM), Applications of Parallel Programming and HPC in CFD (IIT Kharagpur under aegis of National Supercomputing Mission – CDAC)

[1]to be completed in June 2025

EXTRACURRICULAR

- Cadet 36 -JHARKHAND BN NCC,(Ministry of Defense – Govt. of India)| B certificate qualified *March-2022*
- Secured **346th state rank** at Bengal State Level Chess competition – **The Telegraph** *December-2009*
- Swimming at College Square Swimming Club at Kolkata and participated in competition winning **Silver medal** in freestyle and breaststroke category of the competition *August-2010*