ACADEMIC ACHIEVEMENTS

- Secured **AIR 88** in GATE 2021 Metallurgical Engineering among **3486 candidates** *(2021)*
- Achieved **10 out of 10 SGPA** in Last semester of **Bachelors degree** in Metallurgy and Materials Engineering *(2020)*
- Selected as **Top 4 candidates** from the department for Summer Internship at **BARC, Mumbai** *(2019)*
- Bagged **First Class Honours** in Metallurgy and Materials Engineering after successful completion of B.Tech *(2020)*
- Awarded prize for achieving **10 out of 10 CGPA** in secondary examination *(2013)*

M.TECH. RESEARCH

- **Mechanical Behaviour analysis of interface dominated multilayered 3D printed polymers**
  (IIT Bombay, Advisor: Dr Nagamani Jaya Balila) *(May'22-till date)*

  OBJECTIVE:

  - To evaluate the effect of Size, process parameters and type of material on tensile and **fracture behaviour**
  - To Quantitatively analyse the **interface fracture energy** of 3D printed polymers in **mode I,II & III.**
  - To investigate the feasibility of **3D printed polymer composite** and evaluate its mechanical properties.

  METHODOLOGY:

  - Optimised the process parameters to obtain the best mechanical properties like **UTS, Young's Modulus and fracture strain** in 3D printed PLA
  - Evaluted strain maps using **Digital Image Correlation (DIC)** during the mechanical characterisation.
  - Performed **cantilever and clamped beam bending** to quantify interface and through layer fracture toughness of 3D printed polymers like PLA, PC, Nylon and ABS
  - Studied the **state of stress** in test geometries using **Finite Element Analysis (FEA)**

INTERNSHIP & INDUSTRIAL EXPOSURE

- **Bhabha Atomic Research Centre (BARC), Mumbai**
  (Summer Intership) *(Jul'16-Jul'17)*

  OBJECTIVE: Cold rolling and Annealing behaviour of **Ni-Ti-Fe shape Memory Alloy**

  - Studied the **cold rollability** of $Ni_{47}Ti_{50}Fe_3$ **SMA** using hot rolled and hot extruded bars as starting material
  - Investigated the **annealing behaviour** of cold deformed SMA after **isochronal annealing** in range of 450 to 850 C
  - Evaluated the **recrystallisation temperature** by annealing the differently deformed samples of SMA

- **Research Design and Standard Organisation (RDSO), Lucknow**
  (Vocational Training) *(Jun'18-July'18)*
  - Trained for **Non-Destructive** testing, **Metallurgical Investigation** & testing and Welding research

- **Visakhapatnam Steel Plant (RINL), Vizag**
  (Vocational Training) *(Dec'18-Dec'18)*
  - Studied and performed a project on the familiarisation with the **working of Blast Furnace**

TECHNICAL AND ACADEMIC PROJECTS

- **Synthesis and Characterisation of Aluminium-Titanium Diboride ($Al - TiB_2$) Composite**
  (*B.Tech Project, IIEST Shibpur, G: Dr Amitava Basu Mallick)* *(Jul'19-May'20)*

  - Devised a technique to produce **homogeneous Sub-micron (<1 um)** TiB2 particle reinforced Al Composite.
  - Fabricated **In-situ** $Al - TiB_2$ **composite** by the reaction of Al alloy with powdered Ti via **stir-casting route.**
  - Achieved overall **hardness to be 1.53 times higher** than the theoretical value calculated via rule of mixture.
  - Performed **EBSD, SEM + EDS analysis** to confirm the **composition and homogeneity** of TiB_2 particles

- **Effect of Tempering parameters on Molybdenum based High Speed Steel (HSS)**
  (B.Tech Course Project, Heat Treatment Lab, Advisor: Dr. Debdulal Das) *(July'18-Dec'18)*
  - Critically reviewed the co-relation between **alloy carbide formation** and mechanical properties of M2 HSS
  - Observed the effect on microstructure due to different tempering temperatures and heat cycles.
  - Evaluated the changes in **Abrasion resistance/Hardness** due to changes in microstructure during heat treatment.
  - Obtained the **Secondary hardening temperature** with corresponding microstructure and vickers hardness
- **Modelling of Dislocation- grain boundary interactions**
  (*MTech Seminar, IIT Bombay, Advisor: Dr Prita Pant)* *(Jan'22-Apr'22)*
  - **Objective:** To implement the parallelization of **k-fold cross validation** for regression and classification on GPU
  - Defined **CUDA kernels in C** for **Linear Regression** and **Logistic Regression** using Gradient Descent algorithm
  - Achieved speed up of **3.5X** for regression and **2.5X** for classification as compared with serial code
- **Cold spray as an emerging Technology for Bio Materials**
  (*B.Tech Seminar, IIEST Shibpur, Dr Manojit Ghosh)* *(Jan'18-May'18)*
  - Extensive literature survey on **particle-substrate bonding** and interface formation via Cold spray.
  - Filtered out materials based on **Bio compatibility and Structural performance** for medical applications
  - Understood induced stresses in coating and **Adiabatic shear instability** which occur during bonding
  - Studied its various physical and mechanical properties and explored the possible scope for future

MAJOR COURSES

- Iron and Steel Making
- Topics in Mechanical Behaviour of Materials
- Structural Characterization of Materials
- Statistical Machine Learning and Data Mining (Audit)
- Mechanical Characterization of Materials
- Joining of Materails
- Physical Metallurgy
- Diffusion and Kinetics
- Thermodynamics of Materials
- Thermomechanical Processing and Forming of Steel
- Micro-mechanics of Thin Films and Small Structures
- Degradation of Materials and their Prevention

POSITIONS OF RESPONSIBILITY

- **Department Placement Representative, MME** (IIEST Shibpur) *(Feb'18-Mar'20)*
  - Coordinated in a **3 member team** to streamline recruitment procedure for **30+ students** from MME department
  - Targeted **10+ new potential recruiters** and assisted in **placement of 17 students** in different Industries.
  - Established contacts with various corporate HR's, for seamless functioning of placement process.
- **Technical Head of Robotics club, Robodarshan** (IIEST Shibpur) *(Feb'18-July'2019)*
  - Coordinated with a **team of 20+ members** for conduction of Technical Fest which engrossed the **footfall of 1200+**
  - Supervised a **team of 7+ members** for conducting Autonomous technical event **for 60+ students**
  - Spearheaded a **team of 15 member** to educate students about **Arduino and its 20+ sensors** for creating projects
- **Teaching Assistant, IIT Bombay**
  - **Mechanical Behaviour of Materials** (Prof. N J Balila) *(July'22-till date)*
    Worked in a team **mentoring 70+ students**, prepared exam/quizzes and provided assistance in the course
  - **Electrical characterisation of Materials** (Prof. Shobha Shukla) *(Jul'21-Dec'21)*
    Formulated quiz questions, Invigilated examinations and graded the students' final exam answer sheets

TECHNICAL SKILLS

- **Programming and Scripting Languages:** C, Python, MATLAB, Arduino
- **Tools and Technologies:** Energy Dispersive spectroscopy(EDS), Scanning Electron Microscope(SEM), SE and BSE imaging, Nanoindentation, UTM, Single and dual nozzle 3D printer, CNC Laser cutting machine, Optical Microscope
- **Software's:** Abaqus, ANSYS, FreeCAD, SolidWorks,Vic-2D, Origin, Octave,

EXTRA-CURRICUALR ACTIVITIES

- Actively participated in **organising awareness and social action events** through Leaders for Tomorrow (NGO) *(2017)*
- Bagged **Elite** NPTEL Certification in **Programming, Data structure and Algorithms using Python** (IITM) *(2018)*

INTEREST AND HOBBIES

- Robotics, Playing 8 ball and Table tennis, Watching Movies and TV Series