

STATEMENT OF PURPOSE

The fascination and delight of watching an automobile driving across the streets are still the same as my five-year-old self, if not more. From an early age, I realized that the working of a seemingly simple machine as a bicycle involved different forces and parameters and so did the complex ones. My crude curiosity kept me asking a lot of questions which made my fundamentals strong. My sheer willingness to acquire knowledge helped me excel during my entire schooling in a small town in Nepal, a country known for its beautiful and mighty landscapes. Given the geographical and economic conditions then, coming across manufacturing plants was a rare occasion. This led to a craving for the on-hands experience of mechanical engineering but it wasn't fulfilled until I finished my intermediate and joined an undergraduate program.

In August 2016, a new chapter of my life began when I was admitted into **NIT Warangal**, Telangana, India where I pursued a Bachelor's degree in Mechanical Engineering. Coping with university life as a freshman and having to deal with courses like Basic Electrical Engineering and Computer programming that was not directly related to mechanical engineering, was a moderately tricky time. The shift into the mechanical engineering coursework, however, was positive. As I shifted to my field of passion after the first year, studying felt like less of a burden and more of a joy. I was exposed to core courses such as **Machining Science**, Design of Machine Elements, **Mechatronics**, and CAD/CAM which led to a direct increase in my output, reflected by the better performance I achieved. I thoroughly enjoyed learning core concepts and excelled in the associated laboratory courses where I observed and discerned their practical applications through experiments.

The following year, I attended a week-long workshop on robotics at **SkyFi Labs**, Hyderabad. The integration of electronics to move mechanical parts was a known concept, but the learning experience provided a closer insight into the fabrication and working of robots. The functionality of each component such as an IR, ultrasonic sensor, Bluetooth module, etc, and the necessity of a flawless computer program to execute the code on Arduino are the few things that were covered. By the end of the workshop, I was proficient enough to build basic robots such as line followers and advanced ones such as swarm robots. It was my first hands-on experience in the scope of mechatronics. However, it wasn't until a year later that I got an opportunity to use my learning in solving real-world problems.

In the third year of my college, I was presented with an opportunity called Engineering Projects in Community Service (**EPICS**), which is an initiative provided by Purdue University. Along with three of my friends, I started working on a project named "Smart Irrigation System." It involved rigorous research on why water wastage in agriculture exists and how to minimize it. Eventually, a solution was proposed that involved a water pump and few electronics as well as soil and temperature sensors to measure and control the water

content in the soil. The cost of the project was kept as low as possible to increase its affordability.

In 2019, as part of my final year project named "Experimental Investigations on Performance of Passive **DMFC** using Alternative Fuels and different Geometrical Shapes," I was exposed to building components from scratch for experimental analysis. The in-depth research and manufacturing experience gained from working in the team imbued a keen interest in the field of experimental research and analysis. I helped out in the fabrication of a particular shape (cylindrical) for fuel reservoir in the project and it maximized the output from general cuboid shapes.

Despite the challenges put forth in 2020, I adapted and continued with my project work, studies and responsibilities. Staying at home had opened up a new world of possibilities and additional time at hand. I completed various online courses on **Ansys**, MATLAB, Creo, Solidworks, GD&T, and AutoCAD. Later that year, I joined an internship at **Autoninja**, India's Largest Auto-CRM Company, which polished my analytical and deductive skills working with a team of varied experience and knowledge. During the same year, I worked as a subject matter expert at **Embibe**, an Ed-Tech company that provides free learning content with the highest quality standards. I worked in a fairly big team and managed projects of creating educational resources for the needful students.

My life as a student has never been confined to the classroom as I share a tremendous passion for extracurricular activities such as event organizing, team building, elocution, debates, etc. I have proven my leadership skills as the president of a student **club** named News and Magazine Committee that worked closely with university administration to publish the annual institute magazine and publicizing official events conducted at the admin and students' level. Characteristics like teamwork and organization have become some of my strengths. I take pride in my skill to manage events, which has helped my leadership qualities shine through. It includes my volunteering work as an Event Manager at the annual fests of my university. These experiences have sharpened my decision-making abilities, making me a more dependable team player and leader.

For a few months now, I was a part of an open, independent, and non-consulting R&D company called **Simulation Lab**, as a research intern. My work involved testing various features on wing flaps of an aircraft to reduce drag force and improve the **aerodynamic** efficiency of the design model. CFD analysis is done using **Ansys** Fluent. I actively took part in group discussions on test results which provided in-depth knowledge hence, enhancing the experience. Working as a CAE engineer, I have acquired a few concepts regarding the initial phase of product development.

The blend of my undergraduate degree with my industrial and research exposure to date has provided me with great insight into the industrial operation and professional life. Through a graduate degree program at IIT Kharagpur, I can grow upon my strengths and overcome any weaknesses under the mentorship of top-notch faculty at IIT Kharagpur. The Masters in Manufacturing Science and Engineering program at your institute enables me to personalize my study plan and specialize in areas of my liking through courses such as **Advanced Manufacturing** and Theory of Machining. The current work and programs at the department such as using the techniques of Additive and Laser-based Manufacturing for advancement in laser material processing including laser cutting, welding of dissimilar materials, surface hardening, etc, and optimization & modeling of manufacturing processes have certainly intrigued me further. Upon completion of my graduate program, I want to pursue a research-oriented path as a pioneer who is actively involved in the innovation of existing manufacturing systems and the design of new prototypes to further contribute to the community. With my potential and drive to realize my dream of achieving excellence, I see myself as a great fit for the program. I thank you for taking the time to read my statement of purpose and I hope the admission committee will consider my profile favorably.