For more than a century, thousands of engineers have contributed to the evolution of automobiles from massive, heavy, and fuel-intensive to sleek, aerodynamic, fast, and fuel-efficient vehicles, which have made our lives easier. My interest in mechanical engineering has been fuelled by my passion for machines, especially automobiles. Although innovations in the field of automobile engineering have been a boon for people, there are still a lot of vehicles such as tractors that are not readily available to farmers due to their high costs and inaccessibility in rural areas. I want to use my innate aptitude for developing intelligent designs for automobiles to help reduce the workload of laborers, and especially farmers. My aim is to make vehicles more economical and accessible so that they effectively fulfill their job of benefiting mankind and making people's lives easier.

I have had a certain fascination for various machines since childhood, which prompted me to decide on an undergraduate study in Mechanical Engineering. Here, one of my courses was Automotive Engineering, and this made me interested in automobiles and their structural components. Other courses that gave me working knowledge of mechanics were Design of Machine Elements, Dynamics of Machinery, Design of Transmission Systems, Industrial Engineering and Management, and Material Science. I derived a lot of practical knowledge from my practical courses such as Thermal Engineering Laboratory, Dynamics of Machinery Laboratory, Heat, and Mass Transfer Laboratory, and Computer-Aided Machine Drawing Laboratory. These courses helped me gain hands-on experience in designing and analyzing machinery and its components.

My interest in automobiles was ignited when I learned about the subject during my undergraduate studies, and in order to explore my newfound passion, I decided to take up a project where I designed a gearbox for an All Terrain Vehicle. The currently available gearboxes are expensive and have a high weight, and so my objective was to develop a design for a gearbox, which is both economical as well as more efficient than the existing structure. I particularly aimed to design the gearbox to achieve maximum drive shaft articulation and a high power-to-weight ratio as compared to its existing counterparts. I designed the gearbox keeping various parameters in mind and ran its simulation in the software, Ansys. I analyzed its von Mises stress, maximum displacement, and total deformation by applying various loads to the design. Through this project, I experienced designing an important component of a vehicle and learned about the factors that needed to be considered in this process. This experience gave me great insights into design a critical component of an automobile as per the requirements of the project.

As I was studying mechanical engineering, I wanted to take the opportunity to use all that I had learned and so I took up a couple of projects that gave me insights into techniques commonly used in this area. I completed a hardware project where I fabricated an automatic vegetable cutting machine with the help of a 6-bar linkage mechanism. I designed the machine using CAD software and fabricated it using plywood. In this project, I learned how to design using a

machine fulfilling a specific purpose and it gave me a good and diverse experience from my previous project in automobile designing. I also designed and fabricated a mold used for the casting process. Here, I selected the type of wood to be used and performed detailed calculations based on pattern allowances, mold cavity filling time, and solidification time of the mold.

After working on these projects, I decided to take up a more complex project for my final year thesis project, so that I could use a combination of the various techniques that I had learned. In thisproject, I tested various air preheating elements to increase the efficiency of an air preheater commonly used in power plants. I designed the entire setup in the software, SolidWorks using the tolerance stackup technique, and analyzed the setup in Ansys to investigate the loading pattern, fatigue failure, and vibration failure caused by the engine. I also did a lot of physical work such as milling, welding, grinding, lathe machining, and threading, which gave me a lot of hands-on experience with manufacturing tools. This project was a complete one as I was totally involved in every one of its stages starting from literature review and data survey, finalizing the profiles and deciding the layout of the setup, designing the entire experimental setup, fabricating and assembling the setup, calibrating and testing the samples, to analyzing the final data obtained. By the end of this project, I had gained software and manufacturing skills, managed every project detail, and taken it to completion.

After successfully completing these projects, I wanted further experience in the area of manufacturing and so, I completed an internship at Rubicon Steels. This company manufactured railway components and so, this was my dream internship, as I was quite interested in automobiles. Here, I learned a number of manufacturing techniques such as CNC Plasma cutting, laser cutting, CNC machining, arc welding, and mig welding. I was able to witness the manufacturing process of bogie bolsters and transmission shafts and I received an overview of the working and operation of the transmission system of an ICF coach.

After completing my undergraduate studies, I decided to work for a while in order to become a professional and skilled engineer and to get some good industry experience. Hence, I started working at Yamaha Motor Research & Development India (YMRI) as part of the Graduate Engineer Trainee Program. Here, I have been working in the Engine Testing division where my work centers around vehicle performance, emission testing, fuel optimization, calibration, exhaust system, and catalytic converters. I have also worked in the noise group where I have checked for parts causing unwanted noise. I have been a part of the functional and endurance team and I can assemble an entire engine from scratch. My involvement in a new product development has helped me understand the detailed design specifications of a vehicle. Moreover, I have worked with a number of data acquisition software for the capture and analysis of data, 3D CAD, and BOM related software. I have also played a supporting role in a study on market claim activities where I presented my analysis and proposed several countermeasures. Furthermore, I have checked the CVT in scooters to identify the root cause of a market claim for a specific model. In working in different departments and being involved in different types of

tasks, I have understood the interrelationship between each system and how a balance is required to ensure the smooth functioning of an entire company.

Being a part of a professional environment has made me realize that there is a lot of things that I don't know yet, and my experience in research and development has motivated me to seek advanced knowledge in the field of automobile engineering. I have enjoyed working in a competitive environment and I want to continue to do so after my postgraduate studies, preferably in a German company, so that I can experience a new style and quality of work. I want to take up projects in the field of high precision engineering, as I want to build my skill set and use them in challenging situations. My long-term plan is to develop and design an economical agro-farm vehicle that can help farmers perform tasks that are currently difficult for them because they can't afford expensive alternatives.

A master's degree in Automobile Engineering from your University will help me build my theoretical and practical knowledge base so that I can take on challenging projects in this field and give my best to them. I have always considered automobiles to be a complex interplay between existing systems which function together intimately to fulfill its purpose. Concepts like hybrid technology, advanced power trains, electric vehicles, autonomous vehicles, and safe and intelligent mobility excite me and I see myself pursuing my future projects on sustainable and intelligent mobility, and performance automotive engineering. I already have experience working in an automobile company, and I am sure this will help me understand my concepts better. I will be able to practically relate to the topics covered in my classes and understand the basics of all the techniques I have used in my projects. XYZ University is known for its outstanding work in automobile research and to me, a graduate program at your University is a strong opportunity to pursue my interests. I also look forward to exploring the work culture in a different country and getting involved in research at your advanced facilities. I believe that innovation is achieved through a combination of knowledge and experience, and I hope to achieve both at your University.

Given my background in Mechanical Engineering and work experience in Automobile Engineering, it would be a wonderful chance to join your esteemed college and work in a team that is driven by innovation and creativity. I strongly believe that my dedication and commitment to my work makes me a strong candidate for your graduate program, and it will grant me an opportunity to work in a dynamic and industrious environment at your University.