

STATEMENT OF PURPOSE

From an early age, I have been captivated by the intersection of chemistry and sustainability. The ability to apply scientific theory and modelling to address real-world challenges has always fascinated me. My passion for chemical engineering truly flourished during an undergraduate project focused on treating laundry wastewater for optimized reuse within domestic appliances like washing machines. Working through the intricacies of the coagulation optimization process, I was struck by how even small-scale innovations could significantly enhance water treatment efficiency. Witnessing the tangible impact of my work was deeply fulfilling and solidified my commitment to chemical engineering, inspiring me to pursue specialized expertise in sustainable wastewater treatment. This experience drives my ambition to pursue an MS in Chemical Engineering, where I aim to build a robust academic foundation, engage in research, and contribute to innovative wastewater management strategies to promote environmental sustainability.

During my undergraduate degree at SRM Institute of Science and Technology, I proved myself to be adept because of which I was awarded with a scholarship in my second year. This heavily motivated me to further delve into academically challenging concepts of Chemical Engineering like *Transport Phenomena*, and *Process Modeling and Simulation* that implanted the foundational knowledge and helped me streamline my career in these areas. However, I found the “Heat Transfer” course to be challenging because its open-book format was unfamiliar to me as I was used to the conventional way of learning. I developed a sense of self-direction by referring J P Holman’s textbook, and developed a strong understanding of the course. My academic performance opened new opportunities, including internships and projects that further solidified my technical skills in fluid dynamics and wastewater treatment.

In the fourth semester, I pursued a 2-week internship at Gradiant India Pvt Ltd as a Laboratory Assistant, where I became interested in working on sustainable water treatment solutions. Here, my first significant milestone exposed me to a stack of technological sustainable solutions for zero liquid discharge like carrier gas extraction, counter flow reverse osmosis, and bio-infinity, igniting my passion for the sector. This experience trained me to become a meticulous learner, enhancing my laboratory skills. Subsequently, under the guidance of Dr. S. Sam David at SRM University, during my 5th semester, I worked on a project titled “Coagulation Studies in Milli-fluidic Reactor for Laundry Wastewater Treatment,” by utilizing a helical milli-fluidic reactor to perform coagulation continuously. In a group of three, we worked relentlessly amidst the tight schedule of our ongoing undergraduate classes. As a result of this project, we achieved 65% more efficiency than conventional batch coagulation at a desired coagulant concentration and optimized liquid flowrate. Being a day scholar living approximately 30 miles from campus, I made the most of my travel time by studying research articles relevant to my project, which allowed me to efficiently balance my academic commitments and research work, ensuring punctuality and productivity in the lab.

I was fortunate to present my work at the International Conference for Fluid, Thermal, and Energy Systems, hosted by the National Institute of Technology, Calicut. Sharing my findings with an audience of academics and professionals was an enriching experience, and the project is now under review for publication in the *Journal of Multiphase Science and Technology*. These milestones were crucial in shaping my decision to pursue advanced studies, where I could delve deeper into research and technological solutions in environmental engineering.

Currently, I am working as a Research Intern at the Indian Institute of Technology, Madras, under the guidance of Dr. T. Renganathan. My work focuses on the hydrodynamics of a Slurry Bubble Column Reactor, where I am studying liquid centreline velocity under varying H/D ratio and different gas sparger designs. Initially, I faced challenges in adjusting to the new work environment and understanding new concepts, but soon I overcame them through hard work and determination. Working alongside a small team, I was quick to identify anomalies and correct errors, improving data accuracy and precision in nearly 90% of the cases. My hands-on approach towards this project not only enhanced by laboratory skill but also refined my teamwork and time management skills, which are critical to pursue higher education.

Pursuing an MS in Chemical Engineering aligns perfectly with my passion for sustainability and innovation. My undergraduate experiences in research and industry have equipped me with essential skills, fueling my ambition to enhance efficiency in various sectors. I aim to deepen my knowledge and

pursue research to gain hands-on experience and develop innovative solutions that align with my curiosity fostering advancements that resonate with my passion for problem-solving and cutting-edge solutions that drive positive environmental change in my career.

My specific interest in environmental sustainability provokes me to tap the non-conventional water treatment and resource recovery sectors which I believe will find its priority in the upcoming years. After completion of my master's program, I aim to engage in industrial R&D projects focused on innovative and sustainable water treatment solutions. Collaborating with industry experts, I plan to enhance my skills and contribute to advancements in the field. My goal is to publish my findings and stay updated on trends, driving impactful solutions for environmental sustainability. My long-term goal is to lead a large-scale team project in companies like Xylem, Pentair, or Gradiant, where I see myself as a Project Manager, developing real-time solutions for various issues of the world.

University of Pittsburgh has gained my attention with their strong curriculum offered by the Department of Chemical Engineering which emphasizes on real-world applications. The program's specialized courses like carbon capture & storage, and design for circular economy perfectly matches my career aspirations. My interest in University of Pittsburgh firmed when I came to know about Dr. Vikas Khanna, whose research focusses on sustainability science and engineering, which directly relates to my previous research experiences. His publications in the Journal of Environmental Science and Technology have astounded me, and I am eagerly looking forward to work in sustainability sector under his guidance, subsequently fulfilling my greatest goal to become a successful chemical engineer. In addition to academics, University of Pittsburgh offers a vibrant community of scholars and alumni network, which I am eager to be a part of. This will help me to connect to the outer world, enabling me to grow closer to my goals.

In conclusion, I am confident that University of Pittsburgh would be the best fit for me to avail my master's degree in chemical engineering because of their advancing cutting-edge research, experienced and wise faculties, and my life after graduation. Getting admitted in this reputed university would not only help me achieve milestones but also make my parents proud of their ambitious son. I am excited to implement my skills to a better future in the growing field of chemical engineering.