

## Engineering Statement of Purpose #1

Engineering problems first caught my attention through failure analysis rather than design success. During an undergraduate laboratory course, a heat transfer model I built produced results that contradicted theoretical predictions. Investigating that discrepancy required revisiting assumptions, recalibrating measurements, and adjusting boundary conditions. That process shaped my interest in thermal systems and convinced me that advanced engineering work begins where models stop behaving as expected.

I earned a Bachelor of Science in Mechanical Engineering at Coastal Institute of Technology. Coursework in thermodynamics, fluid mechanics, and heat transfer provided a rigorous analytical foundation. These courses emphasized system behavior, energy balance, and performance limits. Laboratory work reinforced theory by exposing measurement uncertainty and practical constraints. Through this training, I developed comfort working with imperfect data and iterative refinement.

Project-based work played a central role in my academic development. In a junior-year team project, I analyzed heat exchanger efficiency under variable flow conditions. My focus involved thermal modeling and comparison between simulated and experimental outcomes. The project highlighted design tradeoffs between efficiency and system complexity. In a later capstone project, I worked on HVAC system optimization for a commercial building model, concentrating on load calculations and energy performance. This experience reinforced my interest in energy-efficient mechanical systems.

Beyond coursework, I assisted in a faculty-led laboratory study on convective heat transfer. My responsibilities included experimental setup, data collection, and result interpretation. Exposure to research methodology introduced me to structured problem framing and reinforced the importance of reproducibility and precision in engineering investigation.

Graduate study represents an opportunity to deepen technical understanding while engaging with more complex systems. The Master's program in Mechanical Engineering at Summit Technical University supports this goal through advanced coursework in thermal sciences and applied modeling. Faculty work in energy systems aligns with my interests, and access to specialized laboratories provides opportunities for applied research.

My short-term goal involves pursuing a thesis focused on energy optimization in mechanical systems. Long-term, I aim to work in roles addressing sustainable energy solutions through rigorous engineering design. Graduate training offers the analytical depth and applied focus required to pursue this path responsibly.