

# Research application

[Business](#)



Nanomanufactured products usually require considerable time for their quality to be accessed.

Nanomanufacturing does not always have the ability to access the quality of their products within the shortest time possible. This consequently delays feedback on the manufacturing section which degrades performance of quality control. Companies incur huge losses since many manufacturing defects pass the quality control undetected and are realized at a later stage. This project is aimed at providing a solution to the problem by developing a system that will help in reducing the time required to analyze nanomanufactured materials. The project suits me because I have an interest in real-time systems.

The project requires the use of sensitive sensors and the results produced in real time. The background I have in engineering drawing and design and electrical engineering will enable me to design and build electrical circuits, computer aided design will enable me use computer to design project components, and the course I took on material processing and workshop practice will enable me come up with project components that suit the desired function. Heat is normally used to change the geometry, structure and properties of solids in numerous processes in a conventional macro scale manufacturing. Application and regulation of such sources of heat is normally difficult since they require accurate control of heat delivered. This project is aimed at building a system that would control such heat sources by regulating the amount of heat produced at a particular time and switching on and off the thermal nonmanufacturing when necessary.

I have an interest in the properties and behavior of materials when subjected to various conditions such as heat and stress. The knowledge I gained in material science, heat transfer, and thermodynamics will help me a lot in determining how various materials used in nonmanufacturing behave when subjected to various amounts of heat. It will also help me choose the best components to use in the project. Moreover, the knowledge I gained in engineering drawing and design and computer aided design will help me in designing necessary circuits and components needed for the project.

**Experimental Investigation of Polymer Transport through Nano- and Micro-Channels**  
This research is aimed at developing an experimental set up that will enable polymeric fluid flow through micro and nano sized channels at various speeds in operating conditions.

Tests will then be done with different fluids at different speeds in channels with measurements of one millimeter to one micrometer and comparing the experimental results with simulated results to come up with recommendations on how to improve both simulation and tooling designs.

My interest in studying the behavior of materials when subjected to different conditions makes me choose this project as it will help me to deeply understand their behavior even at the micro and nano scales. The knowledge I gained in material science and engineering will help in the study the structure of polymeric fluids at the macro and nano scales. Fluid Mechanics and Fluid Flow courses will enable me find the behavior of various polymers when flowing at the nano and micro scales.