

Project Title: [Design of Experiment for Internal Flow Measurements in Pipes](#)

Team Members: Musa Shehu
Sergio Espino

Faculty Advisor: Dr. Donald Mueller and Dr. Hosni Abu-Mulaweh

Area: [Mechanical Engineering](#)

Sponsored by: [Department of Civil and Mechanical Engineering](#)
[Purdue University Fort Wayne, Indiana.](#)

The Department of Civil and Mechanical Engineering at Purdue University Fort Wayne, Indiana is in need of an apparatus for internal flow measurements in pipes for its fluid mechanics laboratory. The department is requesting that the apparatus to be designed and built in-house to demonstrate concepts of internal flow in fluid mechanics. Internal flow in pipes, is an engineering discipline that is commonly applied throughout many industries for the safety and efficiency of transporting fluids for industries. Some of these industries include oil transportation, waste management systems, and sewage systems.

The aim of the project is to allow engineering students at Purdue University Fort Wayne to experimentally study the concepts of internal flow. The apparatus will be built within a budget of \$2500, as proposed by the sponsor. In addition, the apparatus must be capable of producing both laminar and turbulent flows, so that point velocities and flowrates can be measured for both flows. The point velocity measurements will then be used to construct velocity profiles for laminar and turbulent flows. The apparatus will also deduce wall shear stress and friction factor from the measured velocity profiles.