DEPARTMENT OF MECHANICAL & MATERIALS ENGINEERING
COLLEGE OF ENGINEERING AND APPLIED SCIENCE

RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students

APPLICATION DEADLINE: February 8, 2026

PROJECT TITLE: Sound Power Testing of Medical Devices

Physical Requirement :
No requirement

Project's Technical Skills Requirement :
Junior or Senior student in Mechanical Engineering, or a related field Prior experience with data acquisition or experimental testing using LabView or a similar environment Familiarity with using MATLAB to process and plot experimental data Basic familiarity with: Signals and systems concepts FFT and frequency-domain interpretation Sensors such as microphones and accelerometers Interest in medical devices, applied research, or industrial R&D

Project's Available Positions : 1

Dr. Ahmed Allam
Department of Mechanical & Materials Engineering
University of Cincinnati
allamad@ucmail.uc.edu
Metasonics Lab I Applied Acoustics Lab

Project Description

Position Overview
The Applied Acoustics Lab works closely with industry partners on practical engineering problems
related to acoustic testing and sound power characterization with a strong emphasis on hands-on
laboratory work and measurement-based research.
The project involves experimental testing of medical device components used in surgical
environments, where sound and vibration behavior play an important role in performance and user
experience. In this role, you will conduct acoustic measurements in an anechoic chamber (a specially
designed room that minimizes sound reflections), contributing to the collection of high-quality
experimental data used in real product development.
This position is well suited for students who are comfortable working with hands-on measurements,
sensors, and data acquisition, and who are interested in understanding how

sound and vibration are
investigated in practical, real-world engineering contexts.
Primary Responsibilities
Assist with experimental testing of sound power generated from surgical equipment
Work hands-on with microphones, vibration sensors, and other measurement hardware
during testing
Set up experiments and prepare test configurations for acoustic and vibration measurements
Operate data acquisition systems and record time-based measurement data
Perform basic checks to ensure data quality (e.g., appropriate signal levels, background noise,
sensor performance)
Organize experimental data and assist with basic documentation and test summaries
Technical Scope & What You'll Learn
Students in this role gain practical exposure to:
How sound and vibration are measured in real engineering systems
Hands-on use of sensors, instrumentation, and data acquisition hardware
Collecting and working with time-domain measurement data
Basic interpretation of signals in time and frequency domains
How experimental data supports engineering decisions in industry projects
The workflow of industry-sponsored research from testing to deliverables
Desired Qualifications
Strong interest in experimental acoustics, vibrations, or mechanics
Ability to follow detailed test procedures with high attention to detail
Comfortable working hands-on with physical hardware in a laboratory environment
Preferred Qualifications
Junior or Senior student in Mechanical Engineering, or a related field
Prior experience with data acquisition or experimental testing using LabView or a similar
environment
Familiarity with using MATLAB to process and plot experimental data
Basic familiarity with:
Signals and systems concepts
FFT and frequency-domain interpretation
Sensors such as microphones and accelerometers
Interest in medical devices, applied research, or industrial R&D