

AerE344 Pre-Lab Assignment - Experiment Design Component

Lab # 03: Pressure Transducer Calibration

DUE: At lab time for Lab Experiment # 03

In this assignment, you will design an experimental procedure to calibrate an electronic manometer.

What you will be given for your experiment:

- A Setra electronic manometer with a range of +/- 5 inH₂O. It has two pressure ports: one for total pressure and one for static (or reference) pressure.
- A computer data acquisition system to measure the output voltage from the manometer.
- A manometer of known accuracy (Mensor Digital Pressure Gage, Model 2101, Range of +/- 10 inH₂O)
- A plenum and a hand pump to pressurize it. The plenum can only be given positive pressure.
- Tubing to connect pressure sensors and plenum

What your experiment needs to produce:

- Your final product for this experiment is a mathematical relationship (for example, a curve fit) between the pressure applied to the sensor and the voltage that is measured from it. This is typically called a calibration curve.
- When you use this sensor in subsequent lab activities, you will need to convert the sensor's voltage output to a pressure value when you interpret your wind tunnel data.

What you need to turn in for this assignment:

- You should write up a step by step procedure that you will follow when you get to the lab next week.
- If you have to change the procedure somewhat once you get to the lab and start working that is acceptable. However, you must start with a plan.
- *You only need to turn in one plan per lab group.*

Your plan must address the following questions:

- How will you check the repeatability of your results?
- What kind of uncertainty can you attribute to your final calibration curve?