**Lab 1: Title**

**Your Name**

Your Major

Your Minor or Second Major (if applicable)

**ABSTRACT**

This is the template for your lab report. **Except for section headings (e.g. ABSTRACT), delete all instructions and replace with your own text.** Margins are 1-inch all around. Each page should have a header and page number. All text is in Times New Roman font with a line-spacing of 1.5. The title is bold-faced, 18 pt, and centered. The main body text is in 11 pt font. The author entry is bold-faced and centered. The author affiliation is also centered. The abstract should be short (seven lines or so). It summarizes the purpose of the lab (e.g. goals), what you actually did (e.g. wrote an Arduino program), noteworthy results (e.g. you successfully measured some weights). The last sentence or two should describe your opinion on how you benefited from the lab (e.g. feel more comfortable with Arduino, better understanding of how to use a load cell).

**METHODS**

**Except for the section heading, delete all instructions and replace with your own text.**

1) Include a figure showing a **block diagram of the entire load cell measurement system**. The simple block diagram (e.g. drawn in PowerPoint) must include the *measurand*, *sensor*, *signal conditioning*, *data acquisition*, *signal processing*, and *display*. **The label for each block must include the basic function and the specific implementation**. The figure must be centered within the page. An example is shown below:



Fig. 1. Block diagram of the load cell measurement system.

2) Include the design requirement (e.g. max desired load to measure) and load cell specifications.

3) Include calculations (e.g. from PreLab) to explain why a 100 ohm gain resistor was used for the instrumentation amplifier. You must clearly explain the important steps so that the reader can understand your thought process. Include important formulas (typically two to four are sufficient), how you used these formulas (e.g. Vmeas must not exceed a certain value), important intermediate results (e.g. theoretical max Ad = 625), and describe the rationale for choosing RG = 100 ohm. It is very strongly preferred that you type your calculations.

**EXPERIMENTS AND RESULTS**

**Except for the section heading, delete all instructions and replace with your own text.**

1) Explain how the Arduino’s ADC output is converted into Vmeas.

2) Include the key equation that converts Vmeas into the load (grams).

3) Explain the purpose of “zeroing” and “calibrating” your system. NOTE: Buma has posted a pdf of the lab tutorial on the course website. Include your experimentally determined values for Vref and K.

4) Include the snapshot of your AWESOME measurements of the three weights. Try to make the figure no bigger than about 3 inches across – this way you save paper, and trees will be grateful.

**CONCLUSIONS**

This section is not simply “my setup worked”. **You should reflect on the concepts or any valuable lessons you learned in the lab.** If possible, discuss how they relate to other aspects of the course, or the general field of biomedical instrumentation, or public health, or the universe ….

**REFERENCES (OPTIONAL)**

[1] Citation details (e.g. website info) go here.