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| ME3901 D2012 LAB 03  Strain Measurements  3/27/2012  Group Members: |

*D2012*

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# ABSTRACT

{In this portion of the document, include a very brief outline of the key points of the experiment and the procedures your team followed. Often, the Abstract section is written after the experiment has been completed and most of the document has been written. In this way, the team can synthesize a much longer description down to the key points. }

# DESCRIPTION

## {The background and description section of any report are usually the longest portions of the document, for this section contains all the descriptive details of the experiment. Fill in all the areas below. But continue beyond these few headings. This is where background information gained in lectures and in research will come in. This is also where note taking and documenting your work will come in. Document all you do during the experiment.}

## PURPOSE OF THE EXPERIMENT

## EXPERIMENTAL PROCEDURES

## KEY EQUATIONS

## EQUIPMENT LIST

* National Instruments USB-6229 DAQ
* 2310 Signal Conditioner
* Electrical Connector Plate
* Vishay Strain Gage & aluminum plate.

# RESULTS & CONCLUSIONS

{This portion of the document should include everything in terms of data and results which you and your team have learned throughout the experiment. Include any MS Excel tables, or similar arrays of data as long as they are condensed. Extensive arrays or tables of data can be placed in the Appendix section.

Any good results section should include more than mere lists, this section should also include a thorough analysis of the data. For instance, typical questions might how accurate is the data? What are the sources of error in this experiment? Or, how confident are you in the outcome? If the experiment requires groups to calibrate an instrument, then data will likely include a straight line and curve fitting. In that case, a regression analysis would be necessary. What sort of confidence do you have that a line through the data is really straight and fits through the points?

Your conclusion should state whether you believe that the expected results were achieved and how confident you are in the results.}

# REFERENCES

{Any sources used during the experiment should be listed here. This includes text books or instructional books on LabView, or material provided by a supplier’s web site, or third party web sites. Cut and past the URL for any sites used during the course of the experiment. See the example, below, which was written in MS Word’s “citations & bibliography” section under “references.” }

1. All About Circuits, n.d. *Ohmmeter usage, Volume VI - Experiments » BASIC CONCEPTS AND TEST EQUIPMENT.* [Online]   
   Available at: http://www.allaboutcircuits.com/vol\_6/chpt\_2/2.html
2. Bishop, R. H., 2007. *LabView 8 Student Edition.* Upper Saddle River(NJ): Pearson Prentice Hall.
3. Vishay Measurements Group, Inc., 1992. *http://www.mae.ncsu.edu/ssml/Materials/MAE473/strain%20gage%20%28Student%20Guide%20309%29.pdf.* [Online]   
   [Accessed 2011].
4. Vishay Measurements Group, Inc., 1997. *An Introduction to Micro-measurements..* [Online]   
   Available at: http://www.ce.jhu.edu/lori/statics/Sensors2.pdf  
   [Accessed 2012].

# APPENDIX

{Any information, photos, drawings, sketches, data, lists, tables, etc., which are too long for insertion in the regular areas above, should be included here. This means anything that interrupts the natural flow of the document or narrative. This would include numerous detail drawings of some equipment, extensive lists of numerical results, large-scale images, etc.}

## DATA

## PHOTOGRAPHS

{Students should use their cell phone cameras or other imaging devices to capture and document everything you do in the lab. }



Figure . Image of National Instruments, usb 6229 bnc data acquisition box.

## 

Figure . a SET OF bnc-TO-bnc CABLES.

## 

Figure . Schematic for measuring resistance in a resistor.



Figure . Vishay strain gage.

## 

Figure . Specifications on the vishay strain gage.

## 

Figure . Wheatstone Bridge Circuit.

## SKETCHES & DRAWINGS

## LABVIEW PROGRAMMING

# SAFETY REQUIREMENTS

**WORCESTER POLYTECHNIC INSTITUTE**

**MECHANICAL ENGINEERING DEPARTMENT**

**Room: HL-031**

Safety Note: Engineering Experimentation, ME-3901, D-Term 2012

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**(To be signed and given to TA or Instructor before using Laboratory)**

We have added a “user ID card access” key to the lab. Your ID will be programmed to give you access to the lab throughout the term 24hrs per day. You must follow the security procedures of the lab.

In ADDITION to all safety procedures required by WPI, the ME3901 lab requires:

1. **You cannot be alone in the room after normal business hours** – a second person is required in the event of an accident or hazard.

THIS REQUIRES THAT 2 PEOPLE ENTER THEIR ID CARDS FOR ACCESS. IF ONE PERSON ENTERS THEIR CARD, THE DOOR WILL OPEN. HOWEVER, IF A SECOND ENTRY IS NOT RECORDED, THEN WE CONSIDER THAT YOU HAVE ENTERED ALONE - WHICH VIOLATES OUR SAFETY REQUIREMENT.

1. You must use your ID card for access during all hours other than weekdays between 8-5. Even if the door is opened by another, you must pass your ID card through the door lock.
2. Any missing or broken equipment must be reported immediately. Email to the TA’s: Ivo Dobrev and Peter White or Prof. Furlong <cfurlong@wpi.edu> or Prof. Scarpino <cscarpino@wpi.edu>
3. ***The lab is used by several groups. Each student must maintain a clean environment and not leave “experiments in progress” unless it has been cleared by an instructor*.**

I understand and agree to abide by the safety procedures outlined by WPI and the ME3901 Laboratory.

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Student name (printed) (signature) (ID Number) Date

(WPI Copy)