

Strain on a cantilever beam: Deliverables

ME 240: Fundamentals of Instrumentation & Measurement • D. H. Kelley and I. Mohammad • 150 points

Name: _____ Student ID: _____

Lab partners: _____

Please write the following sentence in the box below in your own handwriting and **SIGN**:
“I affirm that I have not given or received any unauthorized help on this assignment, and that this work will be my own.”

Attaching the strain gage

1. (25 points) Attach a photograph of your strain gage, glued to the beam, with a meaningful caption.

Measuring strain of an oscillating beam

2. (6 points) Dimensions of the beam:

$b =$ _____ $T =$ _____ $L =$ _____

3. (5 points) Attach a figure showing the variation of strain over time as the beam oscillated. Axes should be labeled with proper units. Write a descriptive caption for the figure.
4. (5 points) Attach a figure showing the power spectrum of the strain during oscillation and a mark indicating the dominant frequency. Axes should be labeled with proper units. Write a descriptive caption for the figure.

Comparing your measurements to theory

5. (2 points) Predicted frequency f_1 : _____
6. (5 points) Attach a plot or code showing how you predicted f_1 from theory.
7. (2 points) Percent difference between predicted and measured values of f_1 : _____

Technical Writing

8. (20 points) Type and attach an abstract.
9. (20 points) Type and attach an introduction.
10. (20 points) Type and attach a description of the methods used.
11. (20 points) Type and attach a description of your results.
12. (20 points) Type and attach a conclusion for this exercise. A conclusion provides a brief overview of your work and its significance. Begin with a few sentences summarizing key results. Point out the ways in which your results answer, or fail to answer, the central questions of the exercise. Comment on the most important limitations of your results, including accuracy limitations and assumptions on which your conclusions are built. Suggest future work: how could the central questions be answered with greater accuracy and/or fewer assumptions, and do your findings lead to new questions?