Iowa State University
Aerospace Engineering

AER E 322 Lab 01
Practice Experiment and Data Analysis

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Aerospace Structures Laboratory Report
Lab 01 Practice Experiment and Data Analysis
Section 4 Group 2
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Chapter 1

Pre-lab

1.1.   Introduction

Aircraft wings undergo oscillations and other random forces while in flight. This lab replicates and analyzes some of the forces and oscillations a wing will experience in flight while also serving as an introduction to the PASCO tool kits and data processing. To simulate the wing, we used a cantilevered aluminum beam, and to generate and measure the oscillations, we used a PASCO tool kit. There were three rounds of testing; each additional round of testing introduced a new variable into the beam movement that changed the shape of the data. The data was collected using the PASCO tool kit and software provided. After the lab, we analyzed and processed the data in Python to how each variable effected the oscillation of the beam.

1.2.   Objectives

During this lab, our primary objectives were to:

1. Learn how to record data under dynamic conditions and analyze or post-process the data.

2. Observe approximately how a common aerospace structural material might respond to oscillatory forces.

3. Gain familiarity with the PASCO tool kit and the PASCO Capstone software.

1.3. Hypothesis

Chapter 2

Lab Work

2.1. Variables

2.2. Work Assignments

2.3. Materials, Apparatus, and Procedures

2.4. Data

Chapter 3

Conclusion

3.1. Analysis

3.2. Conclusion