Studio 02 Deliverable Guidance

Studio 02 Deliverable Instructions

Overview

- Carefully study this pre-recorded **Video of the Accelerated Motion Experiment (https://uncch.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=0b5fda2e-a726-431c-b2d6-ae170110fae6&start=0)** that mimics what you did in Studio 02.
- Similar to what you did in Studio 02, take position and time data from the video and perform a linearization to determine the acceleration and initial position (and uncertainties) for the both trials (Trial A and B).
- Write and submit an **Abstract** that reports your result. (Note that although you must do the Analysis to get the result, you are **not** submitting the Analysis – only the Abstract!)
- We encourage you to ask questions about this assignment during office hours and on Piazza forum!
- **The Abstract is an individual assignment and is due at 11:59 pm on August 28th**

Detailed Instructions

- Data collection and analysis from the pre-recorded video:
  - Use the **slow-motion close-up segments** of the video to get your data.
  - Stop the video at different points and do the best you can to determine up to 5 values of position and time (the more the better).
  - For the Abstract, make a note about *what part of the cart* you used to make your position measurements against the ruler. Examples include "the front edge of the cart" (most common) or "the end of the bumper extension in front of the cart" (less common).
  - **Notice that the stopwatch does not read zero when the cart is released. Therefore, you cannot get the "time elapsed" values directly from the stopwatch readings. You need to subtract the initial stopwatch reading from each time measured in the video.**
  - Mimic the studio activity perform a linearization using LINEST in Excel.
  - The following items need to be found from the linearization so that you can write the Abstract:
    - The cart's acceleration and acceleration uncertainty for Trial A.
    - The cart's initial position and initial position uncertainty for Trial A.
    - The cart's acceleration and acceleration uncertainty for Trial B.
    - The cart's initial position and initial position uncertainty for Trial B.
- Writing the **Abstract**

- The deliverable assignment is to present your **results** in a written **Abstract**. Your analysis will not be turned in.
- Read the **Lab Assignment Information [link] (https://uncch.instructure.com/courses/97290/modules/items/1372686)** for detailed information about how to write an **Abstract.**
- Report your results with appropriate units and number of significant figures. (Hint: review page 15-17 of the **Measurement and Uncertainty Guide. (https://uncch.instructure.com/courses/97290/files/11794263?wrap=1)** ⬇ **(https://uncch.instructure.com/courses/97290/files/11794263/download?download_frd=1)**)
- Include a brief summary of your interpretations of the results in the conclusion portion of your Abstract:
  - Are your acceleration results reasonable? (Hint: free-fall acceleration is g=9.81 $\frac{m}{s^2}$)
  - Compare the acceleration values you found for Trial A and Trial B. How do the two values compare – do they agree? Do you expect them to agree? What are some potential reasons for their agreement or disagreement? Briefly discuss in your Abstract. (Hint: review page 27-29 of the Measurement and Uncertainty guide.)
  - For each trial, compare the initial position seen on the video (at the moment that the cart is released) to the initial position value found from your linearization analysis (along with their uncertainties). Do they agree? Do you expect them to agree? What are some potential reasons for their agreement or disagreement?

- **Submit your Abstract by clicking on Studio 02 Deliverable: 1-D Kinematics Abstract (Individual Submission) (https://uncch.instructure.com/courses/97290/assignments/683316) on Canvas under Module 02.**