

Project 7 [6 FP “Fluency Points”]:

Present a real-life vibration of a 1-DOF damped system subject to a nonharmonic excitation via an experiment and theoretical analysis

Description:

In either (a). a written technical memo no more than four pages long or (b). a video no longer than 120 seconds:

- Identify or design a 1-DOF forced vibration of an object in or around your house, where the external excitation is a **nonharmonic** forcing function
- Explain the phenomenon and the vibration behavior by:
 - Conducting a simple experiment to
 - capture the motion of the vibrating object
 - visualize the vibration in a displacement vs time plot

and:

- Performing a theoretical analysis and visualizing the solution in a displacement vs time plot
- Compare the experimental and analytical results, and discuss sources of error, validity of your assumptions, etc.
- Reflect on your journey of working on this project

Deliverable:

Present your work in one of the following formats:

- A four-page (max) technical memorandum (tech memo) written solely by you, in PDF
- A two-minute (max) video produced solely by you, uploaded to YouTube

Rules and Formatting:

- This is an individual project, to be done by you and you alone
- If you choose the tech memo option:
 - All rules from Projects 1, 5, and 6 apply here
- If you choose the video option:
 - All rules from Projects 2 and 3 apply here

Submission:

Submit your PDF or Youtube URL in Gradescope only. Submissions by email or other means will be disregarded.

Due on Nov 22, 2021 (Monday), at 11:59 pm CST.

Late submissions will be subject to the “half-life” reduction policy according to the syllabus.

Grading Rubric:

	Fluency			Scaling	Max Possible
	2	1	0		
Technical Rigor	Appropriate object is used to illustrate the vibration type; experiment is well constructed; observed data accurately collected and plotted; theoretical analysis is accurate	Some obvious details missing	Farfetched, or missing most details	1	2
Professionalism	[Video] Video has good quality visuals, clear audio, smooth "flow" and editing; educational and fun; a joy to watch [Tech Memo] Presentation of work is logical, legible, and easy to follow; format is well-structured; free from grammatical or typographical errors; a joy to read	Some issues with the overall look and feel of the deliverable	Full of errors, hard to follow; illegible or unwatchable	1	2
Rationale, Justification, Reflection	Thoughtful and authentic; a comparison of experiment and theory is clearly made; acknowledges limitations/inaccuracy and suggests future (self-)improvements	Insubstantial or vague	Missing altogether	1	2
Max Possible:					6