

**LAB 4: FUNDAMENTALS OF DYNAMICS**  
Due at the end of the lab session.

NAMES:

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Check for each task completed:

• **PART 1: DETERMINE STRUCTURAL PROPERTIES**

VERIFY STIFFNESS: PSEUDO-STATIC LOADING

q Calculated displacement for frame with lateral load of 10 kips.

q Lateral displacement for 10 kip load calculated by Arcade \_\_\_\_\_

VERIFY PERIOD OF VIBRATION: IMPULSE LOADING

q Set impulse load with scale factor of 100 over 2 milliseconds.

q Determined time required for three cycles of motion

o Value \_\_\_\_\_

q Calculated corresponding period of vibration.

o Value \_\_\_\_\_

q Compared with period of vibration calculated in pre lab

o Value \_\_\_\_\_

DETERMINE CRITICAL DAMPING: IMPULSE LOADING

q Analyzed model with *Heavy* damping.

q Used systematic trial and error to determine critical damping.

o Value (include units) \_\_\_\_\_

• **PART 2: RESPONSE TO IMPULSE LOADING**

THE EFFECT OF DAMPING

q Set the damping to 1% critical.

q Ran the simulation for about 5 seconds.

q Determined the number of cycles to reduce the amplitude to less than 50% of the initial peak.

o Value \_\_\_\_\_

Set the damping to 5% critical.

q Ran the simulation for about 5 seconds.

q Determined the number of cycles to reduce the amplitude to less than 50% of the initial peak.

o Value \_\_\_\_\_

THE EFFECT OF STIFFNESS

q Set the damping to 5% critical for this structure.

q Ran the simulation for about 2 seconds.

