CEE 744

Homework assn #1

Use the data from the measured plastic beam free vibration response to estimate the natural frequency (cycles/second) and damping of the beam The data is in the file titled: “free vibr.txt”.

Format of data:

- first column is date of test
- second column is time of test
- third column is output of accelerometer in Volts

To convert the data (volts) to accelerations you need to divide by the calibration factor of 0.500volts/g. That will provide output in acceleration as a fraction of g. For output in in/sec^2 multiply by 386in/sec^2/g.

Find:

1. natural frequency in cycles/sec, list the number of peaks used,
2. damping based on two successive peaks using the first formula based on the log of the ratio of the peaks,
3. damping based on two successive peaks using the formula derived from the series expansion of the exponential,
4. the damping based more than 2 successive peaks, using the final formula with an interval of “m” peaks.

DUE: in class on Thursday, Feb 7