

## Homework 3

Complete Part I first, by taking notes that you will keep for yourself. (*Do not turn these in.*) Type up your answers to each of the questions in Part II and submit it in one double-spaced, Word document with your name on the top under the title. Use 12-point Times New Roman Font with 1" margins on all sides. If you have to do a calculation, solve the problem by hand on a separate sheet of paper. Then take a picture of your work and paste it into your word document in an appropriate place. When you are done upload this into the Dropbox on Blazeview. If you are unable to use Word for the assignment, you may use another software package and upload a pdf instead.

### **PART I: Notes**

1. Read and take notes on the video "Energy of waves and fluids".

### **PART II: Assignment (25 points total)**

1. What are the three different types of waves? (2 points)
2. Describe the four characteristics of an ideal fluid in **your own words**. (4 points)
3. Suppose you wish to drop a 300 N ( $V = 2.0 \text{ m}^3$ ) object into a vat of oil ( $\rho = 125 \text{ kg/m}^3$ ). What is the density of the block? (4 points)
4. Water, of density  $1000 \text{ kg/m}^3$ , flows into a piece of curved pipe at  $2.0 \text{ m/s}$  with a pressure of  $5 \text{ Pa}$ . If the water then goes down  $2 \text{ m}$  into another section of pipe where the Pa is reduced to  $3 \text{ Pa}$ , what is the velocity of the water in the second part of the pipe? (5 points)
5. A  $5 \text{ kg}$  block is oscillating on a spring with a period of  $2.5 \text{ s}$ . What is the spring constant for the spring? (4 points)
6. A standing wave in a  $5 \text{ m}$  long pipe produces a third harmonic
  - a. How many wavelengths fit within the length of the pipe? (3 points)
  - b. What is the frequency of the sound ( $v = 343 \text{ m/s}$ ) produced by the pipe if both ends are open? (3 point)