

## **CHAPTER 15 - FLUIDS AND ELASTICITY**

**Physics for scientists and engineers: A strategic approach; Randall Knight, 2<sup>nd</sup> ed.**

**15.1 Fluids.** Contains the basic definition of fluids and mass density that we discussed about this week in class.

**15.2 Pressure.** This is quite lengthy. You could start with the examples and read the section as needed. Make sure you know how to calculate the pressure in a liquid at depth  $d$  (equation 15.6). Example 15.2 illustrates an important concept.

**15.3 Measuring and using Pressure.** Make sure you understand the difference between gauge pressure and absolute pressure. Look also carefully at the hydraulic lift and make sure you can follow the examples in this section.

**15.4 Buoyancy** - You will look at buoyancy for the labs & tutorials (and we have begun discussing it in class). Focus on Archimedes' principle and the examples. Think about what it means for an object to float or sink, and what the volume of the displaced fluid is in different situations.

**15.5 Fluid Dynamics** - Read this section carefully and focus on the concept of flow rate, the equation of continuity (15.19) and how Bernoulli's equation is applied in the different examples.

**15.6 Elasticity.** All materials are somewhat elastic and can therefore vibrate or oscillate, similar to springs. While Hooke's law describes the behaviour of springs, Young's modulus describes the elasticity of a material and can therefore be used for all objects. Important to become familiar with the definitions of stress and strain, and see the connection between the spring constant and Young's modulus. Look also at the definition of the bulk modulus.