

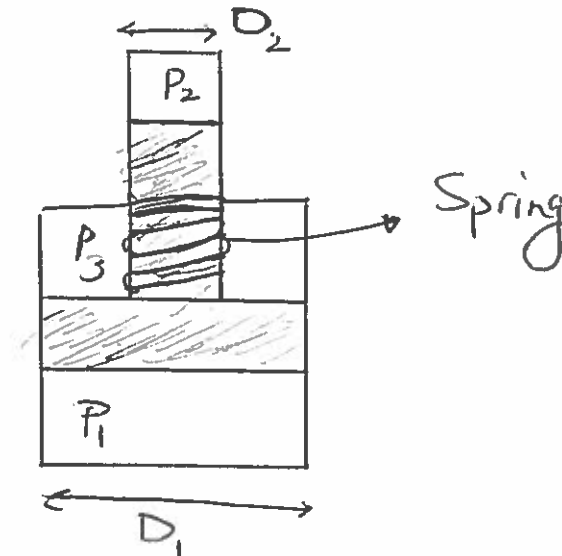
ENGI 2334, Engineering Thermodynamics

Assignment No. 1, Due on Monday, February 1, 2016.

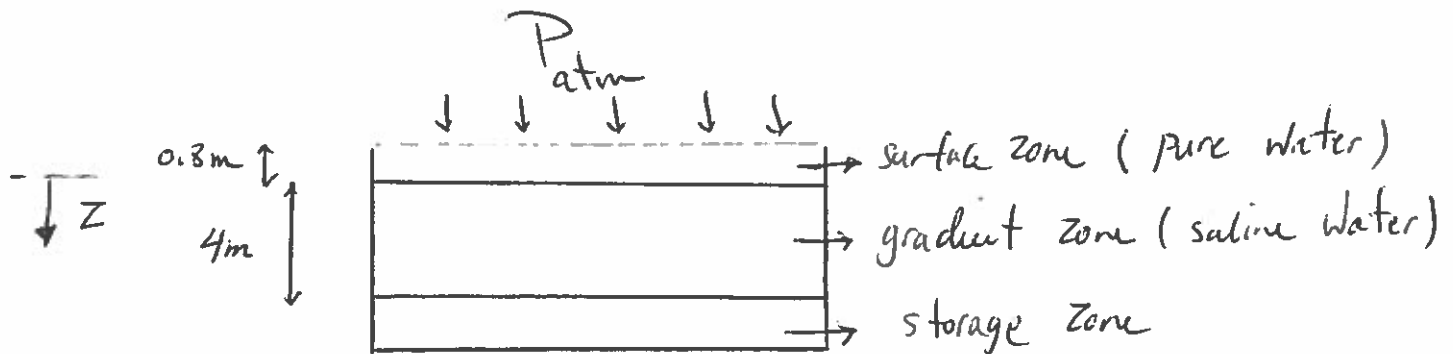
Name:

Student ID:

- 1- The force generated by a spring is given by $F=kx$ where k is the spring constant and x is the displacement of the spring. The spring in the below figure has a constant of 8 kN/cm. The pressures are $P_1=5000$ kPa, $P_2=10,000$ kPa and $P_3=1000$ kPa. The piston diameters are $D_1=8$ cm and $D_2=3$ cm. Calculate the spring displacement.



- 2- In the following solar pond (small artificial lakes to store solar energy), calculate the gauge pressure at the bottom of the gradient zone.



in the gradient zone ρ (the density) changes with depth

$$\rho = \rho_0 \sqrt{1 + \tan^2\left(\frac{\pi z}{4H}\right)} \cdot \rho_0 \text{ is the density of pure water } (1040 \frac{\text{kg}}{\text{m}^3})$$