

## CE 381 SOIL MECHANICS I

### Homework # 1

1. For a saturated soil, given that water content  $w=40\%$  and the specific gravity  $G_s=2.7$ , determine the saturated and dry unit weights of the soil in  $\text{KN/m}^3$  and  $\text{lb/ft}^3$ ?

2. A soil sample has a bulk density of  $1.91 \text{ gm/cm}^3$ , a specific gravity of 2.69 and a water content of 29%. Find:

1. Porosity
2. Void ratio
3. Degree of saturation

Draw the phase diagram showing all terms and their values?

3. A saturated clay has a water content of 46% and a solid density of  $2700 \text{ Kg/m}^3$ . Compute the saturated density of the soil?

4. Show that 
$$\gamma = \frac{(G_s + se)}{1 + e} \gamma_w$$