

# Communication Skills - Speech's Abstract

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## WHY SHIPS FLOAT?

A ship stays afloat because weight and the buoyancy forces keep it in equilibrium.

The weight of a boat is obtained by means of integrating the density of the material over the volume. On the other hand, the buoyancy force is the force which the fluid exercise on the ship. It is computed by integrating the density of the water over the displaced volume by the ship.

Both forces are magnitudes, in order to obtain the application point, a lever of masses is applied. Thus the centre of gravity (CoG) and buoyancy (B) are obtained. "CoG" and "B" have to be in the same vertical, otherwise the boat would have an initial angle of tilt (roll or trim).

At this stage the boat is already floating, but is it stable? Well, another important key point has to be introduced, the so-called metacentre. The metacentre is a figurative point which is representative for small angles ( $0^\circ - 10^\circ$ ), meaning that within that range the variation of volume is to be assumed 0.

Thus when a ship rolls, a new centre of buoyancy appears. The intersection between the previous vertical line and the one created by the new centre of buoyancy, becomes the metacentre. As synthesis, the distance between the center of gravity and the metacentre has to be greater than 0.

Stability will be further explained on the incoming second task.