

Fluid Mechanics Flashcards Che114 Midterm PDF

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What is the definition of fluid mechanics?

Fluid mechanics is the branch of physics that studies the behavior of fluids (liquids and gases) at rest and in motion.

What is the difference between a fluid and a solid?

Fluids can flow and take the shape of their container, while solids have a fixed shape and volume.

What is Pascal's principle?

Pascal's principle states that a change in pressure applied to an enclosed fluid is transmitted undiminished to all portions of the fluid and to the walls of its container.

What is Bernoulli's equation?

Bernoulli's equation relates the pressure, velocity, and height of a fluid in steady flow, stating that an increase in the speed of the fluid occurs simultaneously with a decrease in pressure or potential energy.

What is the continuity equation in fluid mechanics?

The continuity equation states that for an incompressible fluid, the mass flow rate must remain constant from one cross-section of a pipe to another, which can be expressed as $A_1V_1 = A_2V_2$, where A is the cross-sectional area and V is the fluid velocity.

What is viscosity?

Viscosity is a measure of a fluid's resistance to deformation or flow, often described as the 'thickness' or 'stickiness' of a fluid.

What is the difference between laminar and turbulent flow?

Laminar flow is characterized by smooth, orderly fluid motion in parallel layers, while turbulent flow is chaotic and irregular, with eddies and vortices.

What is the Reynolds number?

The Reynolds number is a dimensionless quantity used to predict flow patterns in different fluid flow situations, calculated as the ratio of inert forces to viscous forces.

What is hydrostatic pressure?

Hydrostatic pressure is the pressure exertED by a fluid at rest due to the weight of the fluid above it, increasing with depth.

What is the principle of buoyancy?

The principle of buoyancy states that an object submerged in a fluid experiences an upward force equal to the weight of the fluid displaced by the object.