

Angular Momentum

2

defined as the moment of linear momentum

e.g. $\vec{H}_G = \sum \vec{p}_i \times m_i \vec{v}_i$

\vec{p}_i : vector from centre of mass to m_i
 \vec{v}_i : velocity of m_i
 m_i : mass of particle

for 2-D Problems + RIGID BODIES...

$$H_G = I_G \omega \quad \leftarrow \text{scalar eqn for 2-D.}$$

also we have

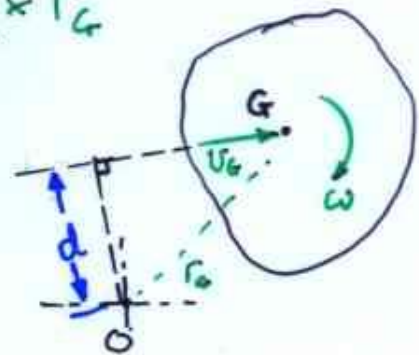
$$\sum M_G = \dot{H}_G$$
$$\int_{t_1}^{t_2} \sum M_G dt = H_{G_2} - H_{G_1} \quad \leftarrow \{\text{angular impulse}\}$$

Note H_G is angular momentum about an axis through the centre of mass

FOR AN ARBITRARY POINT "O"

$$H_O = I_G \omega + m v_G d$$

$$\vec{v}_G \times \vec{r}_G$$



- I_G : moment of inertia about G
- v_G : velocity of centre of mass
- d : perpendicular distance from O to line of action of v_G
- M : mass of body.