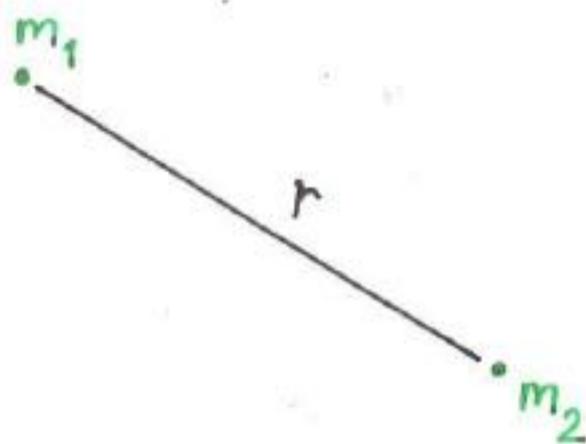


Lecture 2 : Newton's Law of Gravitation

Consider two **point masses** m_1 and m_2 , separated by a distance, r .



Gravitational force on m_1 due to m_2 is :-

$$\vec{F}_{12} = \frac{G m_1 m_2}{r^2} \hat{r}_{12} = -\vec{F}_{21}$$

Gravitational constant = $6.673 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-2}$

Notes

- 1) \hat{r}_{12} is a unit vector from m_1 to m_2 ;
i.e. \vec{F}_{12} is a vector directed along the straight line joining m_1 and m_2
- 2) \vec{F}_{21} has the same magnitude as \vec{F}_{12} , but in the opposite direction
- 3) Gravity is an INVERSE SQUARE LAW - i.e. the force is inversely proportional to square of the separation of the two masses.