



## B-01 Equilibrium of Co-Planar Forces

(2 BP-01 ball bearing pulleys; 2 SL-01 String Lines with end clasps)

**Aims:** This experiment is designed to allow students to observe conditions under which a set of coplanar coincident forces are in equilibrium.

### Conditions to be investigated:

- (I) Equilibrium of two co-planar force vectors  
Equilibrium of three or co-planar force vectors:
- (II) one of which is vertical and other two of equal magnitude
- (III) one of which is vertical and other two not of equal magnitude
- (IV) none of which is vertical

### Learning Outcomes:

After performing this experiment, students will be able to:

- (i) Use a graphical construction to determine the state of equilibrium of three co-incident co-planar forces.
- (ii) Use the spreadsheet supplied to compare results obtained from the method based upon components using trigonometry with the observed results via the graphical approach of (i).
- (iii) Reinforce their understanding of the equilibrium of three co-incident co-planar forces and conditions necessary for equilibrium to be satisfied

### Equipment/Resources Required:

- (i) **TM-00** (Pixi with window frame in “landscape” configuration with transparent film & pens; Set of chrome/stainless steel bearing balls (weight forces) and load buckets; Digital Scales for weight force evaluation)

