

General Physics: Mechanics

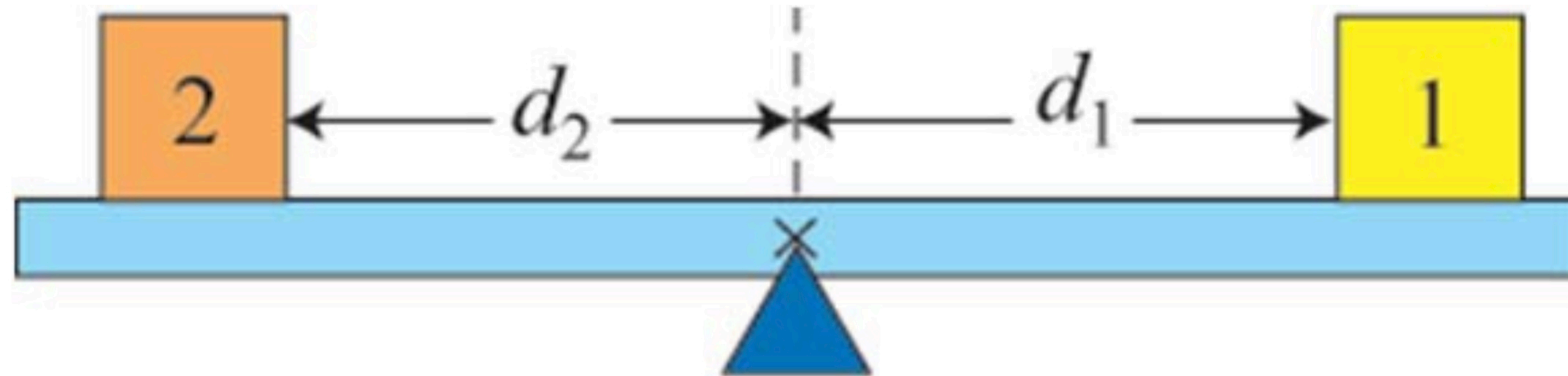
PHYS-101(en)

**Lecture 11b: Rotational motion
and static equilibrium**

Dr. Marcelo Baquero
marcelo.baquero@epfl.ch
November 25th, 2025



Example: Balance beam



A uniform rigid beam of mass m_B is balanced on a pivot under the center of mass of the beam. We place two point-like objects 1 and 2 of masses m_1 and m_2 on the beam, at distances d_1 and d_2 respectively from the pivot. The beam is in static equilibrium.

- A. What is the magnitude of the force exerted on the pivot point?
- B. What is the relationship between d_1 and d_2 for static equilibrium?

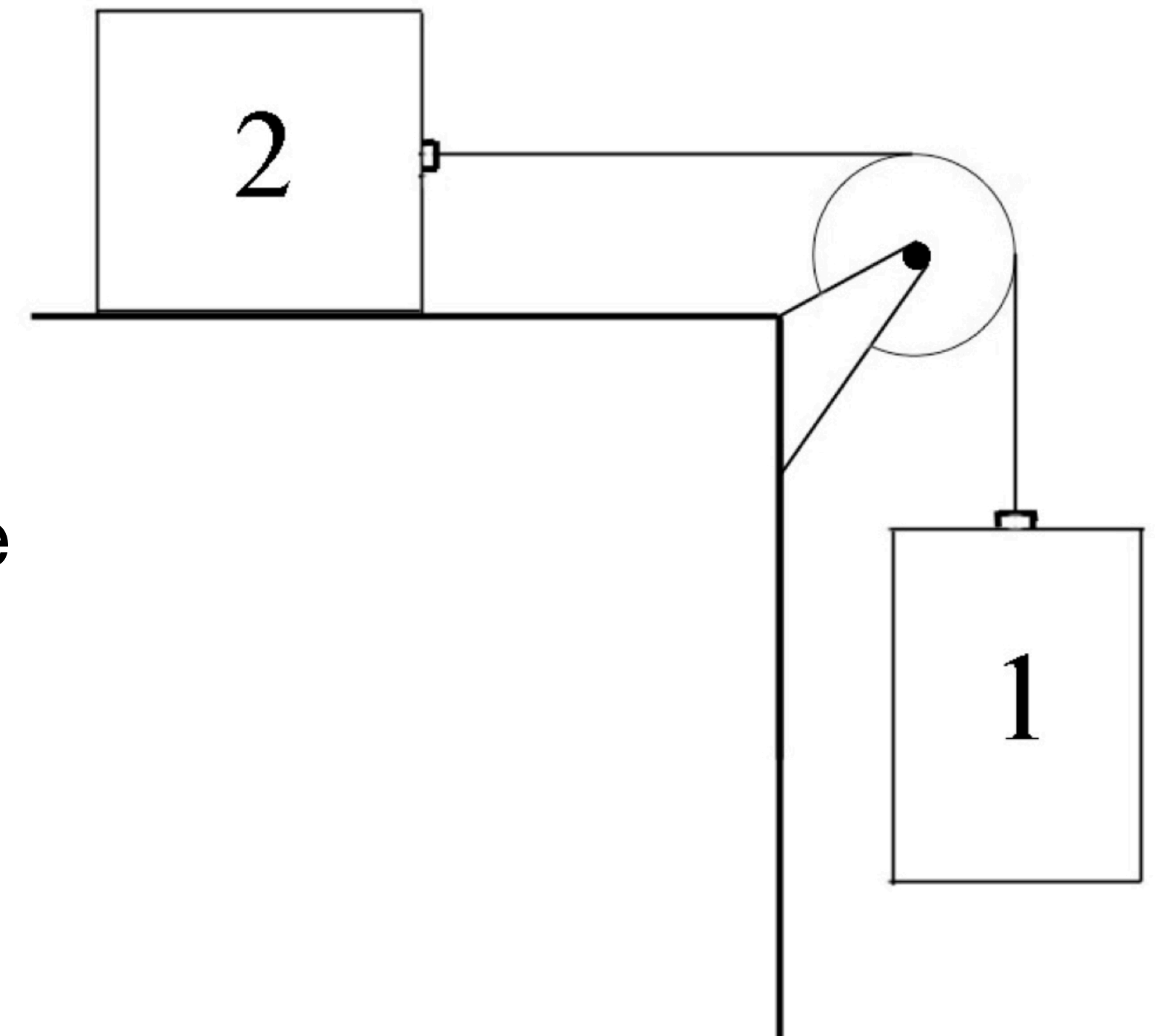
Example: Balance beam

Example: Balance beam

Example: Massive pulley

A pulley (with radius R and moment of inertia about its center of mass I) is attached to the edge of a table. A massless string connects two blocks as shown. Block 1 has mass m_1 and hangs off the edge of the table. Block 2 has mass m_2 and can slide along a table with a coefficient of kinetic friction of μ . Note that $m_1 > \mu m_2$. The blocks are released from rest and the string does not slip around the pulley.

Find the magnitude of the acceleration of each block. Express your answer in terms of R , I , m_1 , m_2 , and μ as needed.



Example: Massive pulley

Example: Massive pulley
