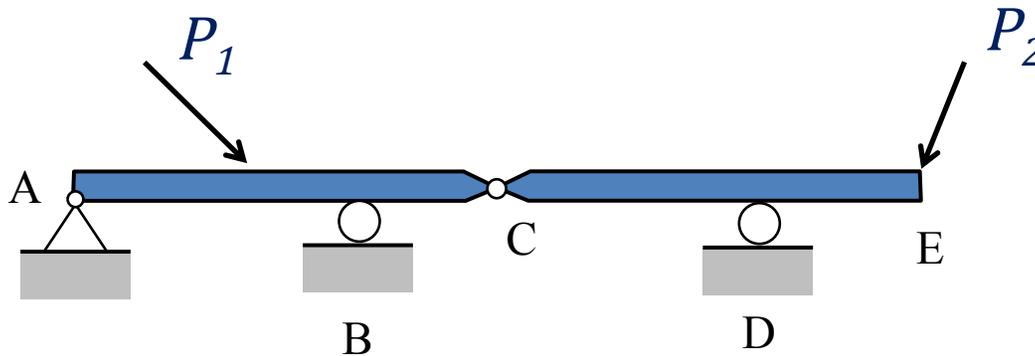# Forces on Rigid Bodies

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External Forces

P_1

P_2

A

C

E

B
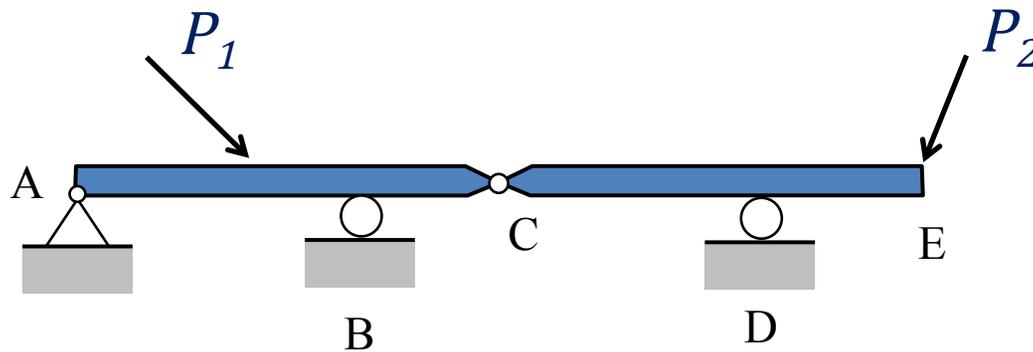
D

P_1

P_2

A

B

C

D

E

A

B

D
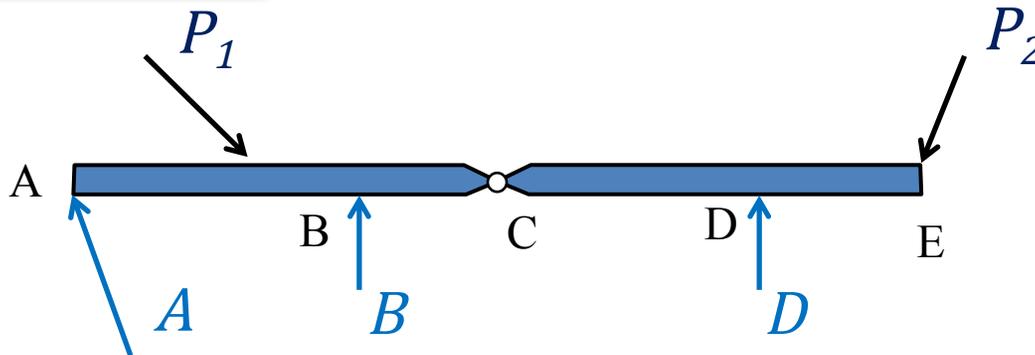
The action of the supports on the beam; A, B, and D; are **External Forces**

Internal Forces

P_1

P_2

A   B   C   D   E

Free Body Diagrams

P_1

C_h

A   B   C

A B

P_2

C_h

C   D   E

D
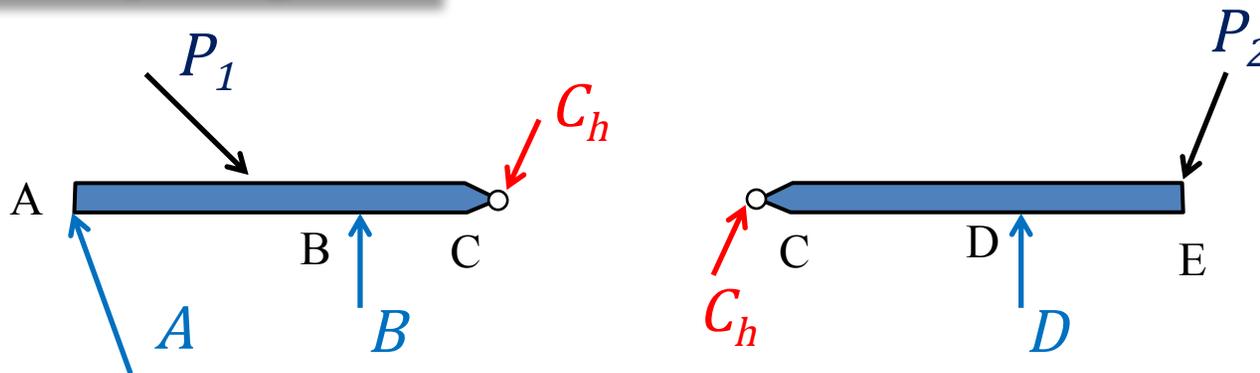
The equal and opposite forces acting at the internal hinge at C are **Internal Forces.**
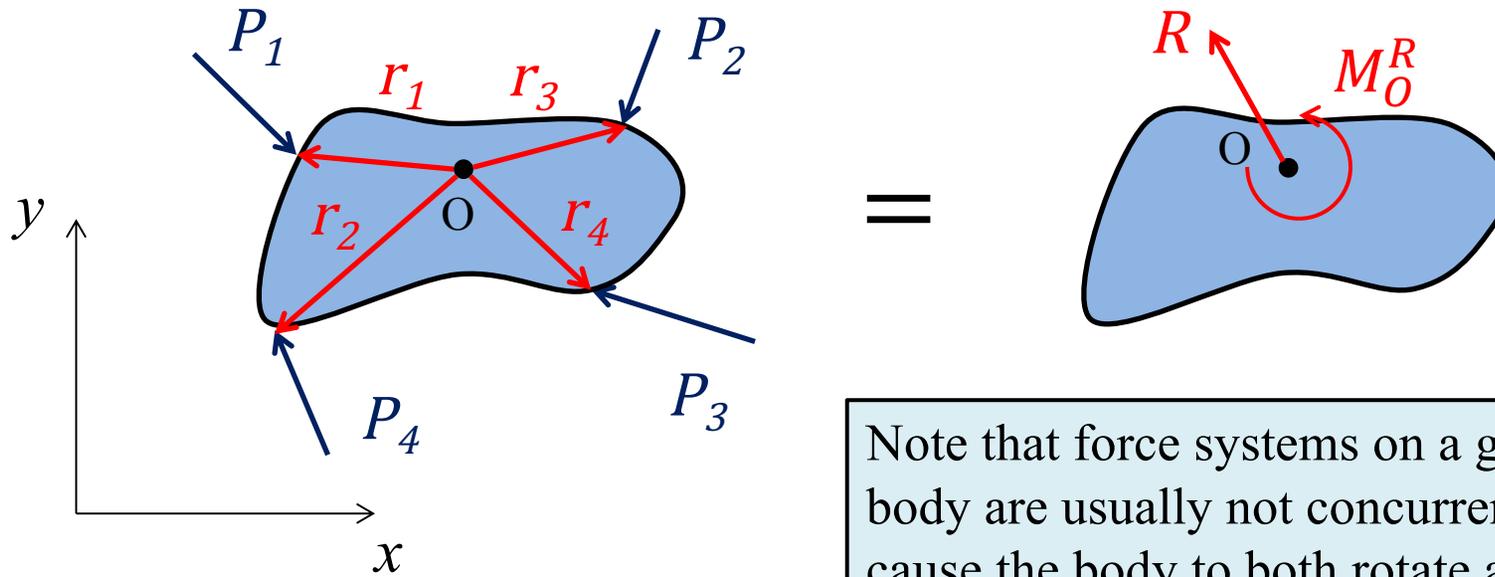
The Principle of Transmissibility

The **Principle of Transmissibility** states:

The condition of equilibrium (or motion) of a body remain unchanged if force F acting at a given point on a rigid body is replaced by a force F' that has the same magnitude, line of action, and sense but acts at a different point.
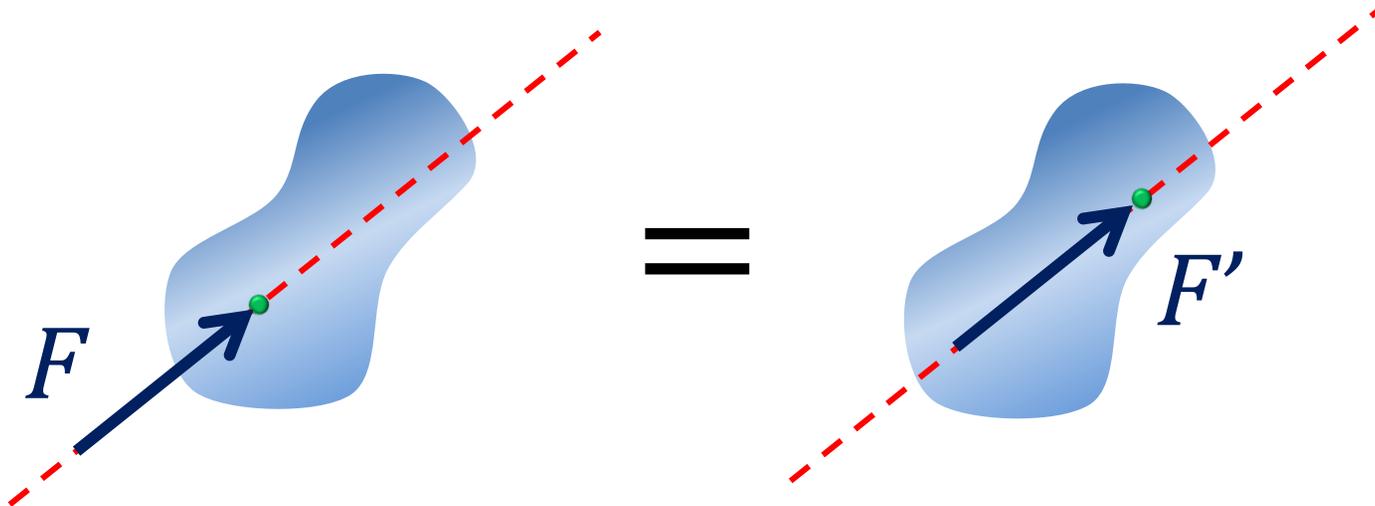
General Force Systems on Rigid Bodies

Note that force systems on a general rigid body are usually not concurrent and can cause the body to both rotate and translate.

In order to study the equilibrium of general force systems on rigid bodies, we need to be able to describe the rotation of the body. We will introduce the concept of moment to describe rotation.