
Week 9



TAM 210/211 Introduction of Statics

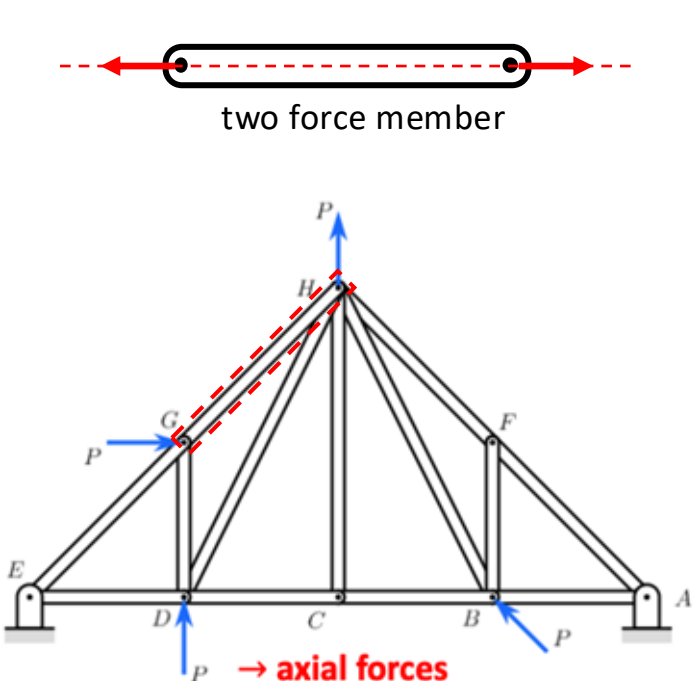
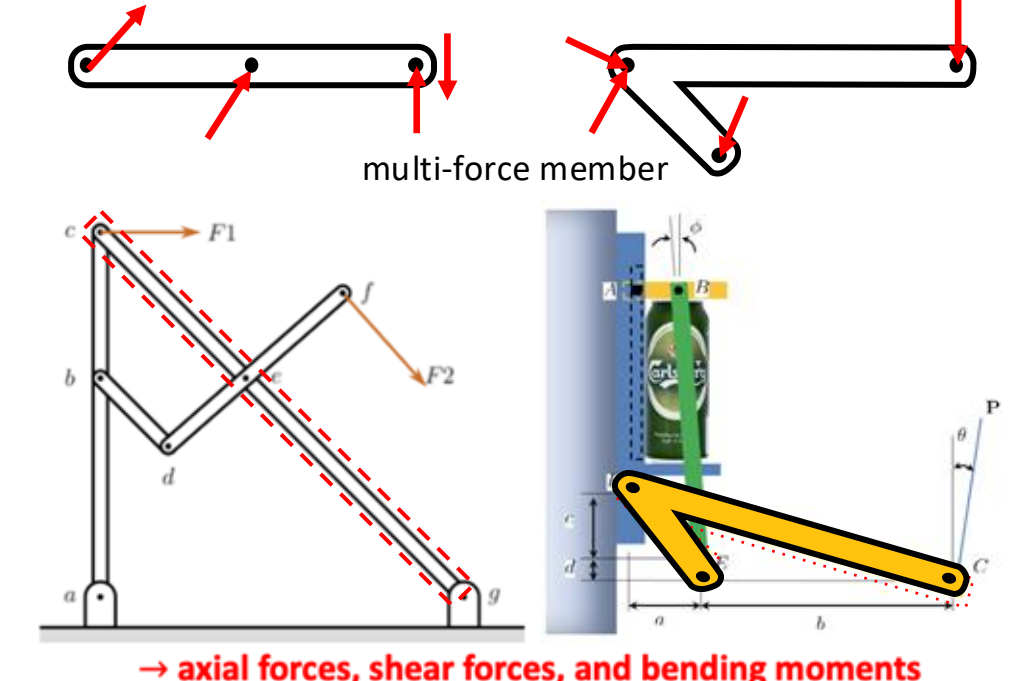
DISCUSSION SESSION



WEEK 9 – Frames & Machines

- What is frames and machines?

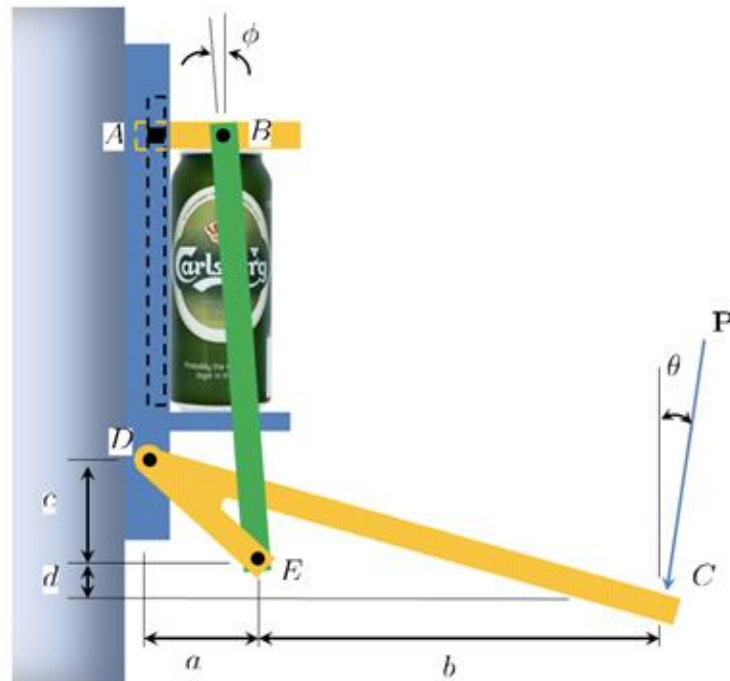
- Truss structures: consist of **only two force members**
- Frames: include **at least one multi-force member** (stationary)
- Machines: include **at least one multi-force member** (movable)

Trusses	Frames and Machines
 The top diagram shows a horizontal member with two red arrows pointing outwards from its ends, labeled "two force member". The bottom diagram shows a truss structure with joints labeled A, B, C, D, E, F, G, H. Blue arrows represent forces: P at joints E, G, H, and B, and P at joints D and A. A red dashed line highlights a section of the truss. Below the diagram, it says "→ axial forces".	 The top left diagram shows a horizontal member with three red arrows acting on it, labeled "multi-force member". The top right diagram shows an L-shaped member with three red arrows acting on it. The bottom left diagram shows a frame with joints labeled a, b, c, d, e, f, g. Blue arrows represent forces: F_1 at joint c and F_2 at joint f. A red dashed line highlights a section of the frame. The bottom right diagram shows a machine with a green can being lifted by a lever. A yellow arrow points to the lever. Dimensions a, b, c, d and angles θ, ϕ are indicated. Below the diagrams, it says "→ axial forces, shear forces, and bending moments".

WEEK 9 – Frames & Machines

- **Frame and machine analysis**

- Method of joints/method of sections is no longer applicable
1. Identify two force members and draw free body diagrams
 2. Identify multi-force members and draw free body diagrams
 3. Define equations of equilibrium and solve them

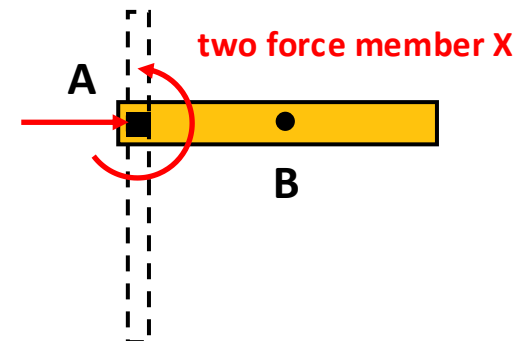
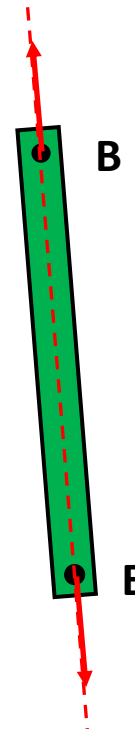
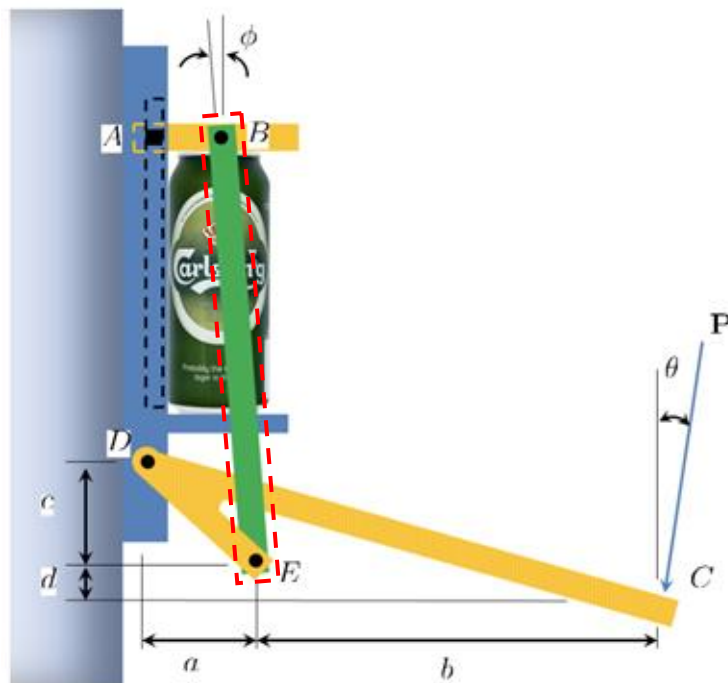


WEEK 9 – Frames & Machines

- **Frame and machine analysis**

- Method of joints/method of sections is no longer available

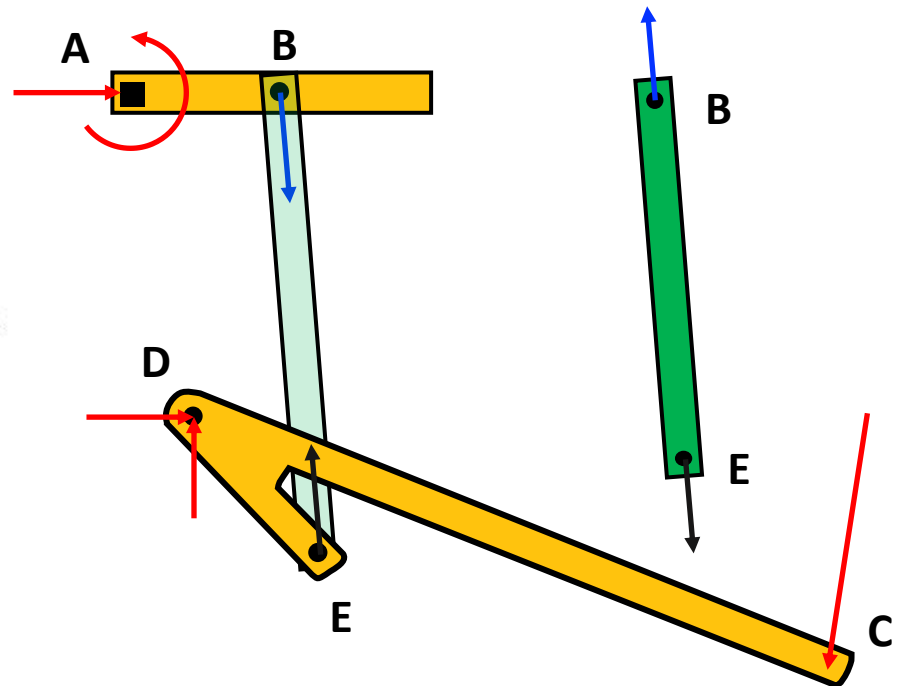
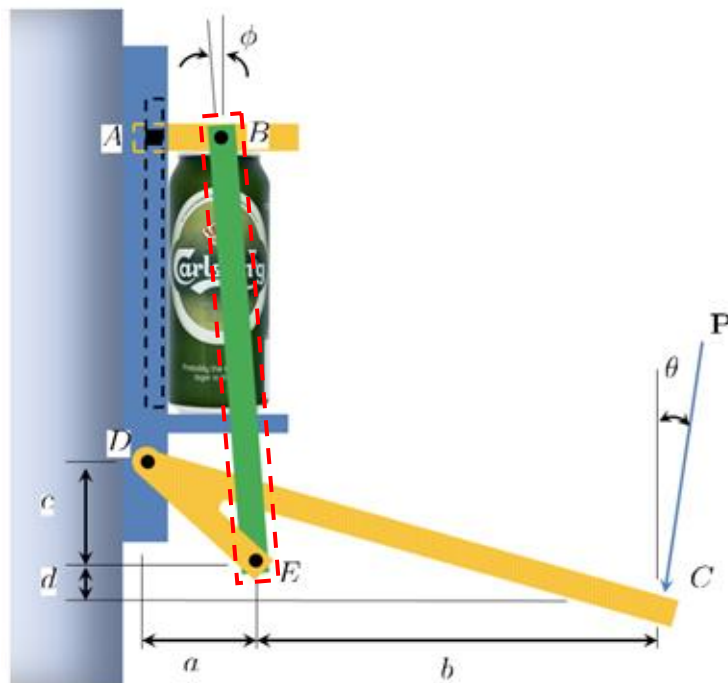
1. Identify two force members and draw free body diagrams → **member BE**
2. Identify multi-force members and draw free body diagrams
3. Define equations of equilibrium and solve them



WEEK 9 – Frames & Machines

- **Frame and machine analysis**

- Method of joints/method of sections is no longer available
- 1. Identify two force members and draw free body diagrams → **member BE**
- 2. Identify multi-force members and draw free body diagrams → **member AB, CDE**
- 3. Define equations of equilibrium and solve them



WEEK 9 – Frames & Machines

- **Frame and machine analysis**

- Method of joints/method of sections is no longer available
- 1. Identify two force members and draw free body diagrams → **member BE**
- 2. Identify multi-force members and draw free body diagrams → **member AB, CDE**
- 3. Define equations of equilibrium and solve them → $\sum \vec{F} = 0$, $\sum \vec{M} = 0$

