

Chapter 6 - Analysis of Structures

In the last chapter we used the equations of equilibrium to analyze a variety of problems. In this chapter we will focus on three types of structures: trusses, frames, and machines.



Trusses are often used in the design of bridges.

Students will be able to:

1) Analyze trusses

- a) define a simple truss
- b) identify commonly-used trusses
- c) identify zero-force members
- d) determine forces in members using the Method of Joints
- e) determine forces in members using the Method of Sections

2) Analyze frames

- a) define a frame
- b) identify multi-force members in frames
- c) use FBDs and equations of equilibrium to analyze each multi-force member or the entire frame

3) Analyze machines

- a) define a machine
- b) identify multi-force members in machines
- c) use FBDs and equations of equilibrium to analyze each multi-force member or the entire machine

Chapter 6 – Structures in Equilibrium

Ch. 1 – 5: Only external forces were considered

Ch. 6: Both external and internal forces will be considered

3 type of structures will be considered:

- 1) **Truss** – a stationary structure made up of only 2-force members
- 2) **Frame** – a stationary structure containing at least one multi-force member (3 or more forces)
- 3) **Machine** – a structure that is designed to move or exert forces (such as a hand tool) containing at least one multi-force member (3 or more forces)