

ENG1001 STUDY GUIDE

Topic 1 Introduction and Loads

- first step in designing a structure is to determine the forces acting on it, that cause it to deform, bend stretch etc. and ensure failure will not occur

Force- a push or pull action on an object

- structures are loaded in different ways: Dead loads, Live loads, Wind loads

Static load- applied slowly, steady state response

Dynamic load- suddenly applied, rapid changes in direction, magnitude and location

Dead Load

- permanent/fixed load
- vertical
- self weight of the structure and all fixed attachments such as partitions, carpets, tiles, etc.

Live Load

- removable loads
- vertical
- temporary or transient loads that act on a structure: people, furniture, vehicles, snow & almost everything else that can be moved throughout a building
- obtained from Australian Standards

- both types are a result of gravity

Gravity- what gives weight to objects and causes them to fall down when dropped from a height. All objects on earth experience a force of gravity directed to the centre of the earth equal to

Force (or weight) = mass*gravity

Units: N (newtons) = kg*m/s²

- use $g=10 \text{ m/s}^2$ or 9.81 m/s^2

Wind Loads

- can act in any direction
- act on the inside AND outside of the building
- they are a function of building size and shape height off the ground