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THEORY OF STRUCTURES

CHAPTER 1 : STRUCTURE
PART 1

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Chapter 1 : Part 1 - Description

- Aims
  - Define the term structure
  - Identify the types and elements of structure.
  - Identify the types of joints and support in structures.

- Expected Outcomes :
  - Able to identify the stability and determinacy of structures

- References
  - Mechanics of Materials, R.C. Hibbeler, 7th Edition, Prentice Hall
  - Structural Analysis, Hibbeler, 7th Edition, Prentice Hall
  - Structural Analysis, SI Edition by Aslam Kassimali,Cengage Learning
  - Structural Analysis, Coates, Coatie and Kong
  - Structural Analysis - A Classical and Matrix Approach, Jack C. McCormac and James K. Nelson, Jr., 4th Edition, John Wiley

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1.1 INTRODUCTION OF STRUCTURES

- Can be defined as forms or shapes such as building, bridges, dams and walls and are design to resist any applied load without losing their own strength capacities and any appreciable deformation.
- Transmit all applied loads to the support systems
- All structure is required to be strong, stable and functioning.

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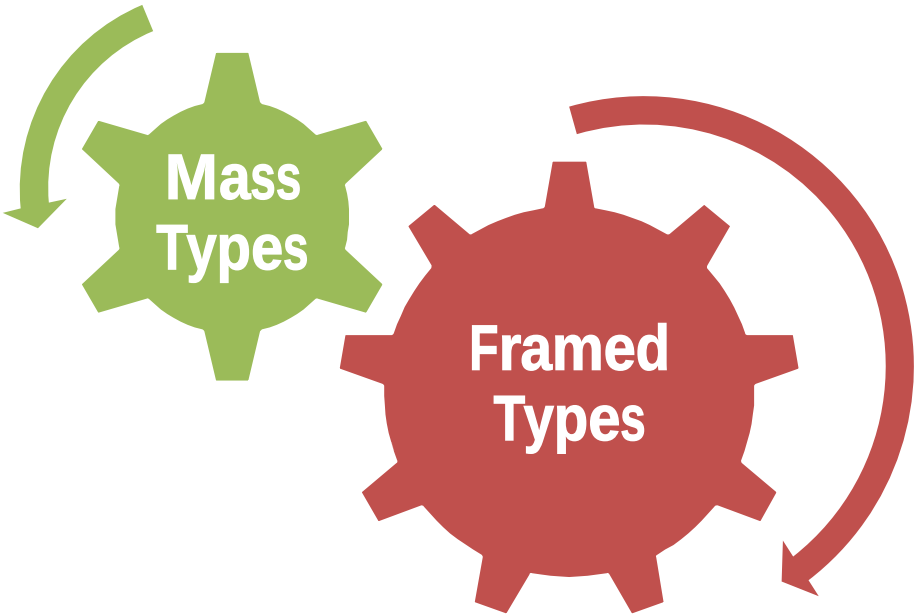
1.2 TYPES OF STRUCTURES

- Can be categorized into :



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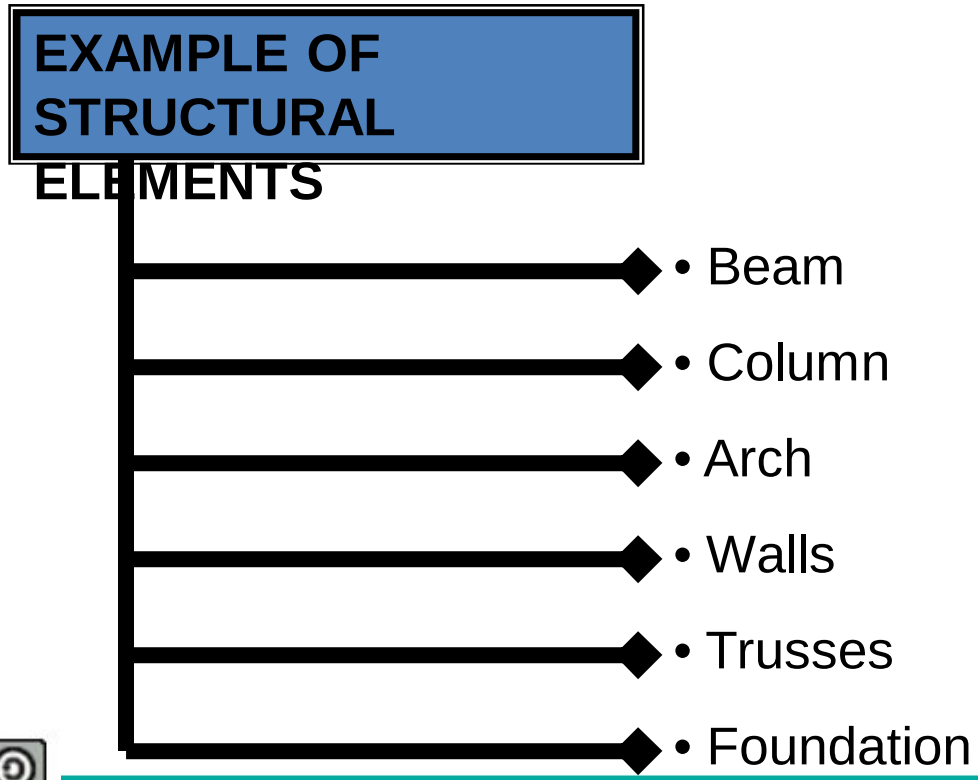
1.2 TYPES OF STRUCTURES

- Framed structure resist the applied loads by virtue of their geometry

- Mass structure are a type of structures which are able to resist the applied load by virtue of their weight.



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1.2 TYPES OF STRUCTURES

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BEAM STRUCTURE

COLUMN STRUCTURE

WALL STRUCTURE

ARCHES

STRUCTURE ELEMENTS

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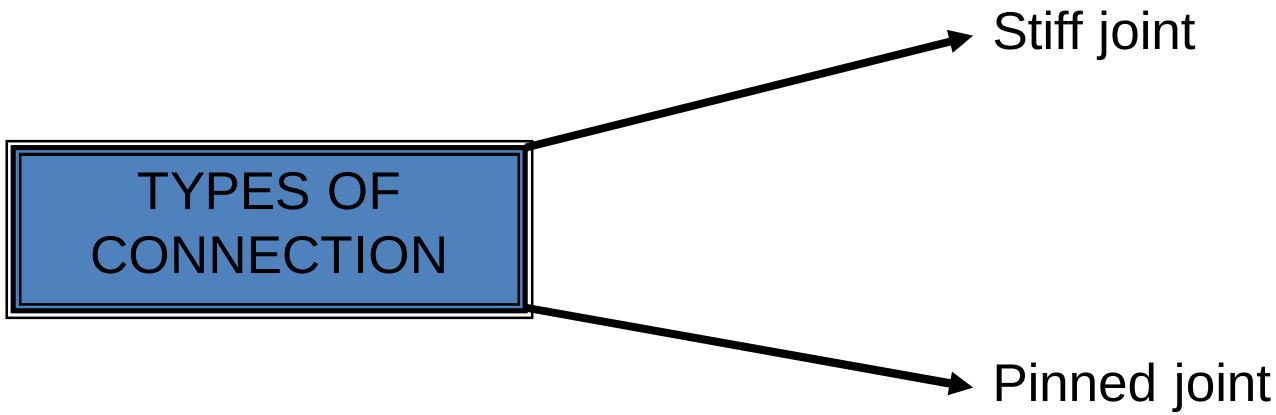
1.3 TYPES OF JOINTS IN FRAMED STRUCTURES



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1.3 TYPES OF JOINTS IN FRAMED STRUCTURES

Stiff Joint

- Considered have fixity at the point of connection and is rigid
- One member meeting at the joint has an effect on the other member

Pinned Joint

- Also known as hinged point
- Common applications: roof trusses and bridges were constructed using pinned joint
- Allow relative movement of the member and its cannot resist bending movement

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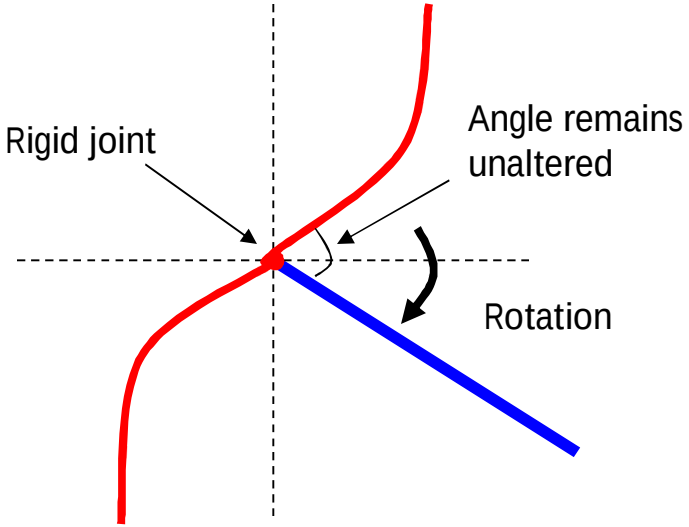
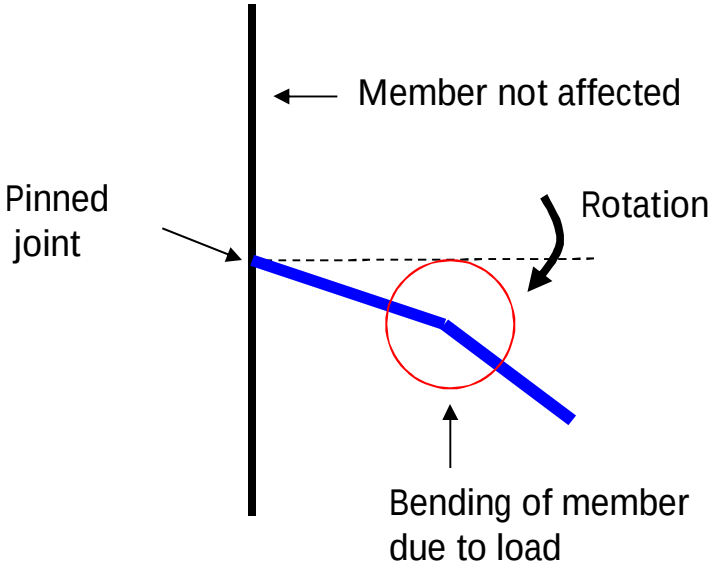
1.3 TYPES OF JOINTS IN FRAMED STRUCTURES



Rotation in Stiff Joint



Rotation in Pinned Joint

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1.4 TYPES OF SUPPORT IN A FRAMES STRUCTURE

TYPES OF SUPPORT	REACTION	NO OF UNKNOWN (DEGREE OF FREEDOM)
pinned		2
roller		1
fixed		3

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THANKS

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