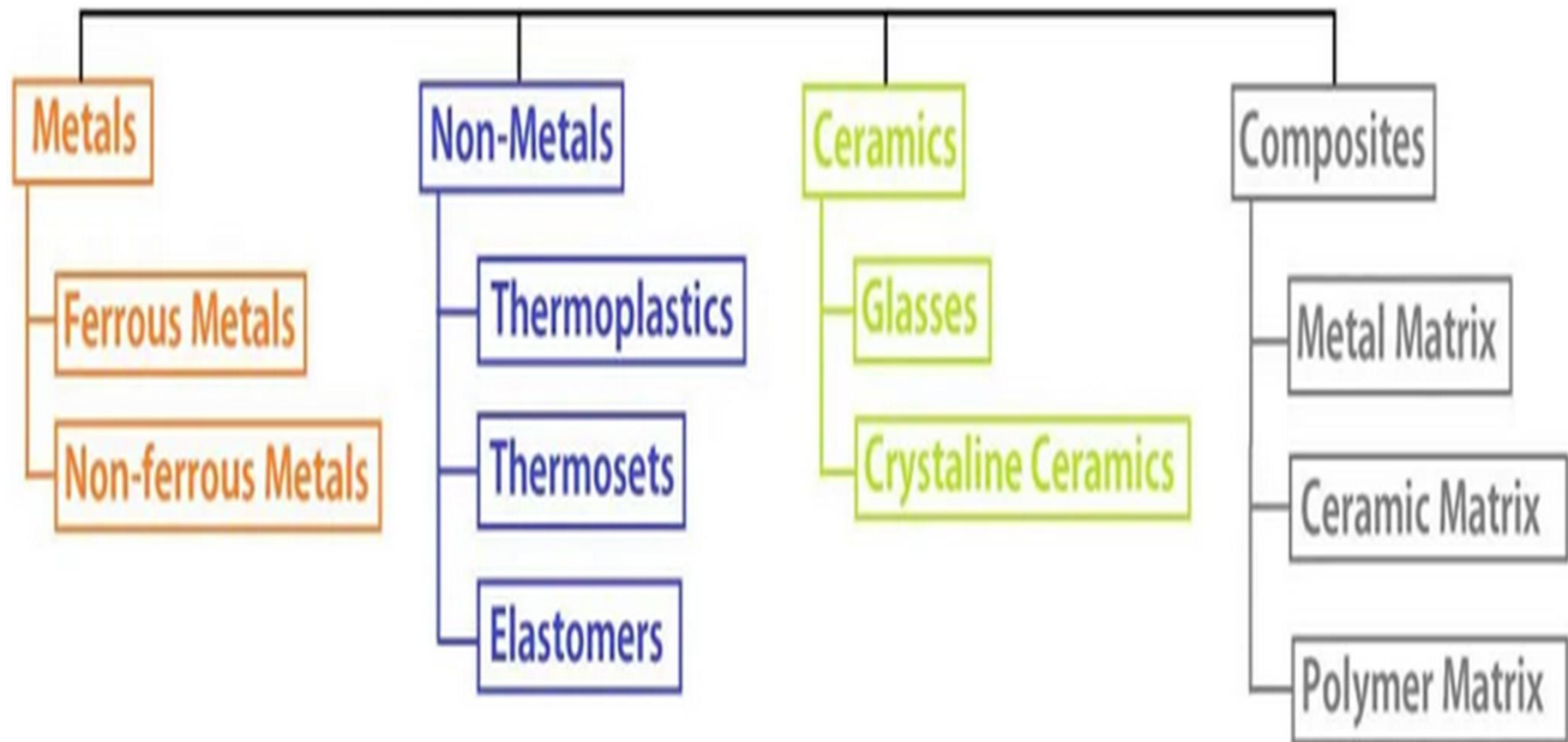# Engineering material

MEE-S205

Classification of Materials/ Engineering Material Classification

In Material science engineering, the materials classified into the following categories.

- Metals
- Non-metals
- Ceramics
- Composites

Classification of Engineering Materials

- **Metals**
  - Ferrous Metals
  - Non-ferrous Metals
- **Non-Metals**
  - Thermoplastics
  - Thermosets
  - Elastomers
- **Ceramics**
  - Glasses
  - Crystaline Ceramics
- Composites
  - Metal Matrix
  - Ceramic Matrix
  - Polymer Matrix

Metals

Metals have good electrical and thermal conductivity and capable of malleable(*able to be hammered or pressed into shape without breaking or cracking*).

Examples of metals are [steel](), iron, copper, aluminium, zinc, silver, lead, etc.

Metals are further classified into the following groups.

- Ferrous Metals
- Non-Ferrous Metals

Ferrous Metals

- Ferrous metals are rich in iron. Iron such as cast iron wrought iron, steel is the main constituents in ferrous metals. Ferrous metals are magnetic and capable of little resistance to the corrosion too.

  Examples for ferrous metals are cast iron carbon steels

- ## **<u>Non-Ferrous Metals</u>**
- These metals have lightweight, high conductivity, corrosion resistance and non-magnetic properties are the specialities of non-ferrous metals. These metals don't have the iron as the composition. Some amount of iron will be added in some of the Non-ferrous metals but it is not a considerable amount.

Example: copper, lead, nickel, tin, titanium and zinc aluminium, etc.

 Some of the Non-ferrous alloys such as brass, gold, silver and platinum.

Non-metals

Non-Metal is referred to the chemical elements which are volatile, insulated to heat and electricity and lack of the metallic attributes. Most of the non-metals are gasses.

Non-metals are further classified into the following groups.

- Thermoplastics
- Thermosets
- Elastomers