Lecture One

9/10/2022

**Engineering Materials:-**

The engineering materials are those materials which are used for engineering and structural purpose, such as to make, bridge, road, machine, building, etc.

**Why Study Materials Science And Engineering?**

1-First of all, the in-service conditions must be characterized, for these material.

2-A second selection consideration is any deterioration of material properties that may occur during service operation. For example, significant reductions in mechanical strength may result from exposure to elevated temperatures or corrosive environments.

3- Finally, probably the overriding consideration is that of economics: What

will the finished product cost? A material may be found that has the ideal set

of properties but is prohibitively expensive. Here again, some compromise is

inevitable. The cost of a finished piece also includes any expense incurred

during fabrication to produce the desired shape.

**Classification of materials According to**

**A-Functional Classification of Materials**

1- Aerospace

2- Biomedical

3- Electronic Materials

4- Energy Technology and Environmental

Technology

5- Magnetic Materials

6- Photonic or Optical Materials

7- Smart Materials

8- Structural Materials

**B-Structural Classification of materials**

* Metals and alloys;
* Ceramics, glasses, and glass-ceramics;
* Polymers (plastics);
* Composite materials

