MATERIALS TECHNOLOGY

SME 3622

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Topic/content

1. Introduction
2. Metal fracture
3. Metal creep
4. Metal fatigue
5. Corrosion
6. Polymer
7. Ceramic
8. Composite

Why study ?

- *An engineer* ~ will be exposed to a design problem involving materials
  - *properties required*
  - *deterioration during service*
  - *cost*
- *Knowledge needed*
  - *materials characteristics*
  - *Structure – property relationship*
  - *Processing techniques*

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By the end of this course :

Able to :

1) explain, analyse and differentiate the failure mechanisms (fracture, creep, fatigue, corrosion) of materials
2) Apply the theory of fracture mechanics in failure analysis
3) Relate structure, properties and processing of non metallic materials (polymer, ceramic, composite)

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References:

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•Smith W.F., Foundation of Materials Science and Engineering, 4th edition, McGraw Hill, 2006.

•Fontana M.G., Corrosion Engineering, 3rd edition, McGraw Hill, 1991.

•Dieter G.E., Mechanical Metallurgy, 3rd edition, 1991.

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