

**Course Number: 28538**

**Course Name: Metallurgy in Manufacturing**

Course Type:
Prerequisite:
Level: Graduate
Group: Applied Mechanics

Type & Max Unit: 3
Corequisite:
First Presentation:
Last Edition:

**Objectives:**

**Topics:**

- 1- Principles of Materials science
- 2- Plastic deformation of crystalline materials
- 3- Steels and cast irons
- 4- Heat treatments of steel and treatment design
- 5- Strengthening mechanisms
- 6- Metal forming and casting
- 7- High temperature deformation of crystalline materials
- 8- Ductile and Brittle fracture of metals and alloys
- 9- Powder metallurgy
- 10- Surface treatments for improving wear and fatigue resistance
- 11- Residual stresses
- 12- Tool steels
- 13- Non ferrous alloys
- 14- Useful hints from Metals handbook
- 15- Principles of materials selection

**References:**

- Foundations of Materials Science and Engineering, W.F. Smith, J. Hashemi, Fourth Edition, McGraw Hill, 2006.
- Engineering Materials, Properties and selection, K. G. Budinski and M. K. Budinski, 7 ED, Prentice Hall, 2002
- The Principles of Materials Selection for Engineering Design, P. L. Mangonon, Prentice Hall, 1999