MSE 812 Phase Transformation & Microstructures

CHs: 3

Pre-requisites: Nil

Course Objectives:

- Understand different solution models which can be later used to understand different binary and ternary systems.
- Have thorough knowledge about types of nucleation
- Understand different examples of phase transformations.

Course contents:

- Ideal and Regular Solution Models, Homogeneous and heterogeneous nucleation,
- Evolution and Development of Microstructures, Binary and Ternary Systems,
- Solidification, Annealing, Precipitation, Diffusion and Non-Diffusion Phase Transformation,
- Nano-Phases and Nano-Structured Materials, Nature of interfaces,
- Nucleation on grain boundaries and dislocations, Spinodal decomposition,
- Discontinuous transformations, Inter-lamellar spacing and growth rate.

Course Outcomes:

- The student will have thorough knowledge about physical metallurgy
- He should be able to apply different theories mentioned in course contents in real life problems (e.g. in industry) as well as for research purpose.

Recommended Text / Reference Books:

- Physical Metallurgy Principles (Reed-Hill)
- Phase Transformations in Metals and Alloys (D.A. Porter, K. E. Easterling)