

ME 606 Solidification Processing (3-0-0-6)

Thermodynamic principles of phase transformations: Binary solutions; equilibrium of heterogeneous systems; Principles of solidification: Nucleation and growth of pure metals and alloys, eutectic solidification; Solidification of ingots and castings: formation of plane front, columnar, equiaxed and dendritic structures; Various solidification techniques viz: sand casting, metal mold casting, continuous casting, zone melting, Rapid solidification, etc., Influence of process variables on the properties of metallic materials.

Textsbooks:

- [1] D.S. Porter & K.E. Esterling, *Phase transformation in metals and alloys*, Chapman & Hall, 1981.
- [2] W. Kurtz and D.J. Fischer, *Principles of Solidification*, edition - 3, Trans Tech Publications, 1992
- [3] John Campbell, *Castings*, Butterworth Heinemann, edition -1, 1998.
- [4] *Casting* , ASM hand book, Vol-15, 1997.