

AMR-11 FUNDAMENTALS OF MATERIALS PROCESSING

1. Overview of various processing methods for materials,
2. Solidification processing, moulding methods, heat flow,
3. Microstructural evolution during solidification & effect of cooling rate on cast microstructures, micro macro segregation in alloys, directional solidification,
4. Rapid solidification, mold design,
5. Solidification shrinkage & riser design, fluid flow fundamental & metal fluidity,
6. Fundamentals of deformation processing -state of stress during various metal working operations, friction & its role in bulk metal forming operations ,
7. Microstructural evolution during deformation processing, workability of metals,
8. Superplastic forming, metal flow & aspects of design during bulk forming operations,
9. Elementary load calculations during various bulk metal working operations Sheet metal forming state of stress during sheet metal forming processes,
10. Forming limit diagram, enhancement of sheet metal formability, Thin films & coatings,
11. Growth of thin films from liquids,
12. Physical vapour deposition (evaporation, sputtering),
13. Chemical vapour deposition (thermal & plasma CVD)

Reference Books:

1. The Science and Engineering of Materials, Donald R. Askeland (Chapman & Hall)