MT206 August 3:0

Texture and Grain boundary engineering

Instructor

Satyam Suwas
Email: satyamsuwas@iisc.ac.in

Teaching Assistant

Email:

Department: Department of materials engineering

Course Time:

Lecture venue:

Detailed Course Page:

Announcements

Brief description of the course

Useful for Senior undergraduate in materials stream, M. Tech. in Materials Engineering and Mechanical engineering

Prerequisites

Materials background

Syllabus

Concepts of texture in materials, their representation by pole figure and orientation distribution functions. Texture measurement by different techniques. Origin and development of textures during materials processing stages: solidification, deformation, annealing, phase transformation, coating processes and thin film deposition. Influence of texture on mechanical and physical properties. Texture control in aluminium industry, automotive grade and electrical steels, magnetic and electronic materials. Introduction to grain boundary engineering and its applications.

Course outcomes

1. Acquaintance with crystallography of polycrystals

2. Knowledge of texture representation and analysis

3. Understanding of texture measurement procedures and modelling

4. Knowledge of textures developed in different types of materials

5. Application of existing knowledge to tailor texture in new materials

6. Familiarization of application of texture to industrial problems

7. Idea of grain boundary structure and its implication in engineering properties

Grading policy

20% for assignment

30% for mid-term

50% for final exam

Assignments

Resources