



PROPERTIES OF MATERIALS (NATURE AND PROPERTIES OF MATERIALS: III)

PROF. ASHISH GARG

Department of Materials Science and Engineering
IIT Kanpur

TYPE OF COURSE : Rerun | Elective | UG

COURSE DURATION : 8 weeks (21 Feb' 22 - 15 Apr' 22)

EXAM DATE : 23 Apr 2022

INTENDED AUDIENCE : B.Tech. Students of Materials Science, Metallurgy, Mechanical Engineering, Electrical Engineering, Chemical Engineering, Physics, Chemistry, Nanoscience and Nanotechnology

INDUSTRY SUPPORT : It is a basic course

COURSE OUTLINE :

The course is an introduction to mechanical and electrical properties of materials. The course will introduce notation of mechanical properties, elastic properties of various materials, plastic deformation in metals and mechanisms therein and also the strengthening mechanisms. It will also introduce the students to the basics of electrical properties of metals and semiconductors with an introduction to Drude theory, quantum mechanics and band theory. Overall, this is an introductory course to materials properties.

ABOUT INSTRUCTOR :

Prof. Ashish Garg is Professor of Materials Science and Engineering at IIT Kanpur. Details of his research and teaching can be accessed on home.iitk.ac.in/~ashishg/

COURSE PLAN :

Week 1: Introduction and Basic Elasticity

Week 2: Mechanical testing and plastic deformation

Week 3: Plastic deformation mechanisms

Week 4: Strengthening mechanisms

Week 5: Electrical properties of metals

Week 6: Quantum mechanics and band theory

Week 7: Semiconductor properties

Week 8: Thermal properties