General Syllabus:

1. Introduction (1 hour)

The tasks, contents and study methods of material physic

2. The crystalline structure of solids (8 hours)

Atomic structure, Molecular structure, Crystal concepts, Substitutional and interstic solutions, Crystal defects.

3. Phase diagram (6 hours)

Concepts of phase, Cooling curve and Phase diagram, One component diagram, Bi Analysis of phase diagram, Lever rule, Gibbs phase rule and Ternary phase diagram.

4. Solid phase transformation (6 hours)

Concepts of phase transformation, The Kinetics of Phase Transformations, Metasta Equilibrium States, The Iron–Iron Carbide ($Fe–Fe_3C$) Phase Diagram, Microstructural a Changes in Iron–Carbon Alloys, Mechanical Behaviour of Iron–Carbon Alloys

5. Mechanical properties (3 hours)

Definition of Stress and Strain, Tension Tests, Compression Tests, Shear and Torsi Elastic Deformation, Plastic Deformation, Tensile properties, Hardness,

6. Thermal Properties (3 hours)

Heat Capacity, Thermal Expansion, Thermal Conductivity, Thermal Stresses

7. Electrical properties (3 hours)

The Free electron model, Experimental electrical resistivity of metals, The hall effe electron model, Energy band structures in solids.

Grading: Project 20%; Homework 30%; Final exam 50%.

- 教案 Teaching Plan
- 视频 Video