Course Outline

Course objectives

1. Understand the structures and bindings of metals, insulators, and semiconductors.
2. Understand the basic relationship between atomic structures, mechanical properties, and defects structures in solid materials.
3. Understand dislocations and plastic deformation in solid materials, and the resulting engineering properties.
4. Understand the basic analytical tools for solid materials.
5. Develop background to study advanced solid materials properties.

Course outline

Crystal structures (atomic and electronic) and defects are crucial to understand the resulting mechanisms of materials properties. The fundamentals are essentially valuable for students in understanding the mechanical and plastic properties of materials macroscopically. Establishment of the student's solid background for future studies is anticipated.

Textbook: