

Course syllabus

Basic Information:

Course title (中文): 固態物理導論

Course title (English): Introduction to Solid-State Physics

Instructor: 大江昌人 (Oh-e, Masahito) (oh-e@ee.nthu.edu.tw) @台達館#838

Language for teaching: English

Class time: M5M6R5 *Location:* DELTA 台達 210

Course Description:

This course offers the basics to understand the properties of solids from microscopic viewpoints with the objective to learn how the physical properties of solids are derived from geometric properties (symmetry) of crystals in which atoms are regularly arranged. One highlight is to learn crystal structures, the concept of reciprocal lattice and wave diffraction, and the other is to understand energy band structures. In this course, we try to emphasize the connections between chemistry and physics; therefore, we start with chemical bonding theories first. The instructor will try to vary teaching ways, using notes, readings, presentations and in-class discussions to guide students through several solid-state topics.

* The course is offered in English.

Textbook

C. Kittel, "Introduction to Solid State Physics", 8th edition (Wiley)

Course materials:

Available on <http://lms.nthu.edu.tw>

References:

M. A. Omar, "Elementary Solid State Physics", 4th edition (Addison Wesley)

Teaching Method:

Combination of blackboard teaching with power point viewgraphs.

Syllabus:

1. Chemical bonding
2. Crystal structure
3. Reciprocal lattice
4. Crystal binding
5. Phonon I: Crystal vibration

6. Phonon II: Thermal properties

7. Fermi gas

8. Energy band

** The contents and plans will be appropriately changed and adjusted during the course.

Grading:

Tentative:

Homework and class attendance & participation (30%), Midterm (30%), Final exam (40%)

*** This may be adjusted in the end of the semester.