Electron Theory in Solids (固態電子理論)

Course level : Graduate students
Course goals : Understanding the theory of electron in solid, including electronic properties in nano-scale.
Text Book :

"Solid State Physics for Engineering & Materials Science," by John McKelvey, Krieger Publishing, ISBN 0-89464-436-X

Handouts will be provided

Course Outline

1. Crystalline Properties (9/15, 9/22)
2. Classical Physics (9/29, 10/6)
3. Quantum Mechanics (10/13, 10/20)
4. Statistical Mechanics (10/27)
5. Classical Free electron in metals (11/03)
6. Exam 1 (11/10)
7. Quantum Mechanics for crystals (11/17, 11/24)
8. Semiconductor Materials Properties (12/1, 12/8, 12/15)
9. PN junction (12/22)
10. Nano-scaled solid-state electronic properties (12/22)
11. Exam 2 (12/29)
12. Final Presentation/Report (1/5)

Grading : Exam 1- 30%, Exam 2- 30%, In class presentation20%, report 20%.

The presentation and the report have the same topic that is relevant to solid-state electronics. Use the knowledge and technique learned from this course for the presentation and the report. Plagiarism or cheating will lead to failure of getting credits from this course. The presentation and the report have to be proceeded in English. The report must be turned in by or at the class of the final presentation. Late turn-in will not be accepted.

Evaluation of presentation and report will depend on whether the following items are adequately presented.

Significance

Organization
Depth
Coverage
Q&A

The report has to follow a formal paper format.