

# SOLID STATE PHYSICS I (PHYS 666) 2015S

Instructor: Prof. Bogdan Dabrowski, Physics Department, NIU. You can find me in my office (LT 216; phone: 753-6474) or in my labs LT 215 and FR 110 (phone: 753-6472). If I am not at NIU you can also reach me at Argonne National Laboratory (phone: 630-252-5541) or at email [dabrowski@anl.gov](mailto:dabrowski@anl.gov).

Course meeting time and place: 3:30 – 4:45 PM on Mondays and Wednesdays at FR 205.  
Office hours: on Mondays and Wednesdays from 1:00 to 2:00 PM at LT 216.

The required textbook: Ashcroft and Mermin, *Solid State Physics*.

Chapters and topics we will cover follow closely a table for Two-Semester Introduction in our textbook (Second semester will be PHYS 667):

Ch. 1 Drude Theory of Metals (1.5 classes)  
Ch. 2 Sommerfeld Theory of Metals (1.5 classes)  
Ch. 4 Crystal Lattices (1.5 classes, substitute)  
Ch. 5 Reciprocal Lattice (1 class, substitute)  
Ch. 6 Structures from X-ray Diffraction (1.5 classes, substitute)  
Ch. 8 Bloch's Theorem (2 class)  
Ch. 9 Nearly Free Electrons (2 classes)  
Ch. 10 Tight binding (1 class)  
Midterm Exam: (1 class)  
Ch. 12 Semiclassical Dynamics (2.5 classes)  
Ch. 13 Semiclassical Transport (2.5 classes)  
Ch. 14 Measuring Fermi Surface (1.5 classes)  
Ch. 15 Band Structure of Metals (2 classes)  
Ch. 17 Beyond Independent Electron (2.5 classes)  
Ch. 19 Classification of Solids (2 classes)  
Ch. 20 Cohesive Energy (1 class)  
Catch up/Review (1 class)  
Final Exam: May 4

Several chapters or parts of chapters will be assigned for reading. There will be several problems solved in class for every chapter we study. Additional problems will be assigned as homework every week. I will collect and grade these problems the following week – there is no substitute for solving problems on your own. There will be closed-books mid-term and final exams.

The grades will be based on the total amount of points you would accumulate during the course (homework 25%, mid-term exam 25%, and final exam 50%):

A (4.00)	90 – 100%
A- (3.67)	80 – 89 %
B+ (3.33)	72 – 79%
B (3.00)	64 – 71%
B- (2.67)	56 - 63%
C+ (2.33)	48 – 55%
C (2.00)	40 – 47%
D (1.00)	32 – 39%
F (0.00)	31% or less

NIU abides by Section 504 of the Rehabilitation Act of 1973 regarding provision of reasonable accommodations for students with documented disabilities. Moreover, your academic success is of importance to me. If you have a disability that may have a negative impact on your performance in this course and you may require some type of instructional and/or examination accommodation, please contact me early in the semester so that I can provide or facilitate in providing accommodations you may need. If you have not already done so, you will need to register with the Center for Access Ability Resources (CAAR), the designated office on campus to provide services and administer exams with accommodations for students with disabilities. CAAR is located on the 4th floor of the University Health Services building (753-1303). ***I look forward to talking with you to learn how I may be helpful in enhancing your academic success in this course.***

I hope you will enjoy the course!