

PHYSICS 669a

Spring 2001

Group Theory and Symmetries in Physics

Course Information

The purpose of this course is to introduce the general ideas of group theory and its application to quantum systems in particular to condensed matter physics.

Instructor: Dr. Maki
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Office: SSC 214C
Office Hours: MW 2:00-3:00 p.m.

Text:

1. Tinkham "Group Theory and Quantum Mechanics"
2. Landau-Lifshitz "Quantum Mechanics"

References:

1. Ziman "Principle of Theory of Solids"

Grading:

Homework	30%
Midterm	30%
Final	40%

*Midterm examination may be replaced by take home exam.

SYLLABUS

#	Week of	Topics	Reading
1	January 8	Introduction	Chapter 1
2	January 15	Group Theory, Definition, etc.	Chapter 2
3	January 22	Example of Groups of Finite Order	Chapter 2 (cont.)
4	January 29	Theory of Group Representations	Chapter 3
5	February 5	Examples	Chapter 3 (cont.)
6	February 12	Applications of Group Theory	Chapter 4
7	February 21		Chapter 4 (cont.)
8	February 26	Midterm Exam	
9	March 5	Rotation Group & Unitary Group	Chapter 5
10	March 12	Wigner-Eckart Theorem	Chapter 5 (cont.)
11	March 19	Selection of Topics	Chapter 6 Chapter 7
12	March 26	Solid State Theory	Chapter 8
13	April 2	Electrons & Phonons in Crystals	Ziman
14	April 9	Landau's Theory of the Second Order Phase Transition	Landau-Lifshitz
15	April 16	Final Exam on April 20	