

Course Information	
Course title	Solid State Physics (1) (tigp)
Semester	110-1
Designated for	COLLEGE OF ENGINEERING TIGP-MOLECULAR SCIENCE AND TECHNOLOGY
Instructor	
Curriculum Number	Phys8094
Curriculum Identity Number	222 D5300
Class	
Credits	3.0
Full/Half Yr.	Half
Required/ Elective	Elective
Time	Thursday 7,8,9(14:20~17:20)
Remarks	The upper limit of the number of students: 20.
Course Website	https://www.phys.sinica.edu.tw/TIGP-NANO/Course/2021_Fall/2021_Fall_SolidStatePhysics.html
Course introduction video	
Table of Core Capabilities and Curriculum Planning	Association has not been established
Course Syllabus	
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Solid-state Physics (I)

Lecturer: Chang, Chia-Seng 張嘉升教授

Classroom: P101 Meeting Room, IoP, AS

Class hour: Every Thursday, 14:10-17:00

On-line teaching link: Webex Meeting link:

<https://asmeet.webex.com/asmeet-en/j.php?MTID=m9db6c263578f16f1d95f9da0c977e09e>

Meeting number: 2511 771 0324

Password: 8794SSD

Course link: [https://www.phys.sinica.edu.tw/TIGP-](https://www.phys.sinica.edu.tw/TIGP-NANO/Course/2021_Fall/2021_Fall_SolidStatePhysics.html)

[NANO/Course/2021_Fall/2021_Fall_SolidStatePhysics.html](https://www.phys.sinica.edu.tw/TIGP-NANO/Course/2021_Fall/2021_Fall_SolidStatePhysics.html)

Course Objectives

This course intends to equip students with some basic understanding about the current research in condensed matter physics. From the fundamental to more sophisticated phenomena, it covers a wide scope with emphasis on more conceptual building than the rigorous formulation. Students are required to have some quantum mechanics and statistical physics background, in order to digest the comprehensive content of this subject and appreciate its profound implication in today's technological applications.

Textbooks

Introduction to Solid State Physics, Editor by Charles Kittel, the 8th edition

Condensed Matter Physics, Michael P. Marder (2000)

Solid-State Physics, James Patterson and Bernard Bailey, the 2nd edition (2010)

Syllabus

Week 01(09/16)

Introduction and General Guidelines

Week 02(09/23)

Crystal Symmetries and Bindings

Week 03(09/30)

Reciprocal Lattice and Diffraction

Week 04(10/07)

	Electrons in Periodic Potentials
Course	Week 05(10/14)
Description	Calculations of Energy Bands
	Week 06(10/21)
	Lattice Vibrations and Elasticity
	Week 07(10/28)
	Dynamics of Bloch Electrons
	Week 08(11/04)
	Transport Phenomena
	Week 09(11/11)
	Midterm Written Exam (50%)
	Week 10(11/18)
	Semiconductors
	Week 11(11/25)
	Electronics
	Week 12(12/02)
	Magnons and Magnetic Resonance
	Week 13(12/09)
	Superconductivity
	Week 14(12/16)
	Dielectrics and Ferroelectric
	Week 15(12/23)
	Optical Properties of Solids
	Week 16(12/30)
	Nanostructures

	Week 17(01/06) Final Written Exam (50%) Grading Midterm Written Exam (50%) Final Written Exam (50%)	
Course Objective	待補	
Course Requirement	待補	
Student Workload (expected study time outside of class per week)		
Office Hours		
References	待補	
Designated reading	待補	
Grading		
Progress		
Week	Date	Topic