國立東華大學

教學計劃表　Syllabus

課程名稱(中文) Course Name in Chinese	固態物理(一)			學年/學期 Academic Year/Semester	113/1
課程名稱(英文) Course Name in English	Solid State Physics (I)				
科目代碼 Course Code	APH_D0050	系級 Department & Year	博士	開課單位 Course-Offering Department	物理學系
修別 Type	選修 Elective	學分數/時間 Credit(s)/Hour(s)	3.0/3.0		
授課教師 Instructor	/葉旺奇				
先修課程 Prerequisite					

課程描述　Course Description

學習固體的
幾何性質（晶體結構），
力學性質（彈性、聲學），
熱學性質（熱傳導），
電學性質（導體、半導體、超導體），
磁學性質（順磁、抗磁、鐵磁、反鐵磁），以及
光學性質。
Study the
geometrical properties (crystal structures),
mechanical properties (elastic, acoustic),
thermal properties (thermal conductivity),
electronic properties (conductor, semiconductor, superconductor)
magnetic properties (paramagnetism, antimagnetism, ferromagnetism, antiferromagnetism), and
optical properties of solids.

課程目標　Course Objectives

瞭解固態物質的結構及其物理性質。

	系專業能力 Basic Learning Outcomes	課程目標與系專業能力相關性 Correlation between Course Objectives and Dept.'s Education Objectives
A	具備物理與相關應用領域之專業知識Possessing professional knowledge in physics and related application fields.	●
B	能以物理知識與邏輯推理，分析解決物理問題Being able to analyze and solve physics problems based on basic knowledge in physics as well as logical reasoning.	●
C	瞭解當代實驗儀器之原理，並具備操作實驗儀器之能力Understanding the principles of up-to-date equipment and being able to operate them for performing physics experiments.	
D	能利用電腦處理各類物理問題Being able to use computers for solving various physics problems.	
E	對學術倫理有清楚正確之認知Properly and clearly acknowledging the academic ethics.	
F	具備以口頭報告及論文寫作發表研究成果之能力Possessing the skills of oral presentation and scientific writing for publishing research findings.	

G	具備科技發展之國際觀及外語溝通能力Having an international view of the technology developments and being able to use a foreign language for communications.	◯

圖示說明Illustration ：● 高度相關 Highly correlated ◯中度相關 Moderately correlated

授 課 進 度 表 Teaching Schedule & Content

週次Week	內容 Subject/Topics	備註Remarks
1	晶體結構 -- 實空間 Crystal Structures -- Real space	
2	晶體結構 -- 實空間 Crystal Structures -- Real space	
3	晶體分析 -- 倒空間晶格 Crystal Analysis -- Reciprocal lattice points	
4	晶體分析 -- 倒空間晶格 Crystal Analysis -- Reciprocal lattice points	
5	力學性質 -- 鍵結強度與彈性係數 Mechanical Properties -- Bond strength and elastic modulus	
6	力學性質 -- 鍵結強度與彈性係數 Mechanical Properties -- Bond strength and elastic modulus	
7	力學性質 -- 聲學性質 Mechanical Properties -- Acoustic properties	
8	力學性質 -- 聲學性質 Mechanical Properties -- Acoustic properties	
9	期中考試週 Midterm Exam	
10	熱學性質 -- 熱傳導 Thermal Properties -- Thermal conductivity	
11	熱學性質 -- 熱傳導 Thermal Properties -- Thermal conductivity	
12	電學性質 -- 導電性 -- 自由電子模型 Electronic Properties -- Electric conductivity -- Free electron model	
13	電學性質 -- 導電性 -- 自由電子模型 Electronic Properties -- Electric conductivity -- Free electron model	
14	電學性質 -- 導電性 -- 近乎自由電子模型 Electronic Properties -- Electric conductivity -- Nearly free electron model	
15	電學性質 -- 導電性 -- 近乎自由電子模型 Electronic Properties -- Electric conductivity -- Nearly free electron model	
16	電學性質 -- 導電性 -- 半導體 Electronic Properties -- Electric conductivity -- Semiconductors	
17	電學性質 -- 導電性 -- 半導體 Electronic Properties -- Electric conductivity -- Semiconductors	
18	期末考試週 Final Exam	

教 學 策 略 Teaching Strategies

☑ 課堂講授 Lecture ☑ 分組討論Group Discussion ☐ 參觀實習 Field Trip

☐ 其他Miscellaneous:

教 學 創 新 自 評 Teaching Self-Evaluation

創新教學(Innovative Teaching)

☐ 問題導向學習(PBL) ☑ 團體合作學習(TBL) ☐ 解決導向學習(SBL)

☐ 翻轉教室 Flipped Classroom ☐ 磨課師 Moocs

社會責任(Social Responsibility)

☐ 在地實踐Community Practice ☐ 產學合作 Industy-Academia Cooperation

跨域合作(Transdisciplinary Projects)

☐ 跨界教學Transdisciplinary Teaching ☐ 跨院系教學Inter-collegiate Teaching

☐ 業師合授 Courses Co-taught with Industry Practitioners

其它 other:

學期成績計算及多元評量方式 Grading & Assessments									
配分項目 Items	配分比例 Percentage	多元評量方式 Assessments							
		測驗 會考	實作 觀察	口頭 發表	專題 研究	創作 展演	卷宗 評量	證照 檢定	其他
平時成績(含出缺席) General Performance (Attendance Record)									
期中考成績 Midterm Exam									
期末考成績 Final Exam									
作業成績 Homework and/or Assignments	100%		✓		✓				
其他 Miscellaneous (_____)									

評量方式補充說明
Grading & Assessments Supplemental instructions

同學可以在開學第一、二週的時候對於評量方式提出建議與討論，獲得任課老師與修課同學同意後可以變更評量方式。開學第三週開始評量方式將維持不變到學期結束。
Students can raise suggestions/discussions on the course evaluation methods during the first two weeks of the semester. If the lecturer and the other students agree, the evaluation methods can change accordingly. Starting from the 3rd week the evaluation methods will remain and continue throughout the semester.

教科書與參考書目（書名、作者、書局、代理商、說明）
Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)

Introduction to Solid State Physics, 8th Ed., Charles Kittel.

課程教材網址(含線上教學資訊,教師個人網址請列位於本校內之網址)
Teaching Aids & Teacher's Website(Including online teaching information. Personal website can be listed here.)

Online course: Google Classroom
class code: ttvjbxg
url: https://classroom.google.com/c/Mzg5NTcyODY2MTMw?cjc=ttvjbxg

其他補充說明 (Supplemental instructions)