國立東華大學

教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	半導體物理AA			學年/學期 Academic Year/Semester	113/1
課程名稱(英文) Course Name in English	Semiconductor Physics				
科目代碼 Course Code	PHYS3230AA	系級 Department & Year	學三	開課單位 Course-Offering Department	物理學系
修別 Type	學程 Program	學分數/時間 Credit(s)/Hour(s)	3.0/3.0		
授課教師 Instructor	/彭文平				
先修課程 Prerequisite					

課程描述 Course Description

半導體物理原理與基礎理論

課程目標 Course Objectives

從固態物理出發，介紹半導體基礎知識，建立理解固態電子元件運作原理的物理觀念與實際元件操作。

	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	具備物理之基礎背景知識Possessing fundamental knowledge in physical sciences.	●
B	能運用基本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	對目前測量器材有基礎認識，且具有操作物理實驗儀器的能力Being acquainted with modern equipment and being able to operate them for performing physics experiments.	●
D	能使用基礎電腦程式語言解決物理問題Being able to use basic computer programming for solving physics problems.	●
E	善用各種資訊平台進行論文資料蒐集的能力Being able to use various platforms for data collection benefiting a topical research.	
F	具備科技發展的國際視野以及外語溝通的能力Having an international view of the technology developments and being able to use a foreign language for communications	
G	能整合物理與其它領域知識Being able to integrate the knowledge of physics with that of other fields.	●

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	9/11 (Wed.): Introduction to semiconductor physics	
2	9/18 (Wed.): The crystal structure of solid	
3	9/25 (Wed.): Introduction to quantum mechanics	
4	10/2 (Wed.): Introduction to the quantum theory of solids	

5	10/9 (Wed.): Introduction to the quantum theory of solids/The semiconductor in equilibrium	
6	10/16 (Wed.): Conference meeting	
7	10/23 (Wed.): The semiconductor in equilibrium	
8	10/30 (Wed.): The semiconductor in equilibrium	
9	期中考試週 Midterm Exam 11/6 (Wed.): Carrier Transport phenomena	
10	11/13 (Wed.): Carrier Transport phenomena	
11	11/20 (Wed.): Nonequilibrium excess carriers in semiconductors	
12	11/27 (Wed.): Midterm Exam	
13	12/4 (Wed.): Presentation (The pn junction)	
14	12/11 (Wed.): Presentation (The pn junction diode)	
15	12/18 (Wed.): Presentation (Metal-semiconductor and semiconductor heterojunctions)	
16	12/25 (Wed.): Presentation (Fundamentals of the MOSFET)	
17		
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 General Performance									
期中考成績 Midterm Exam	35%								
期末考成績 Final Exam									
作業成績 Homework and/or Assignments	30%								
其他 Miscellaneous (Presentation and report)	35%								

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

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.)

Semiconductor Physics and Devices (Donald A. Neamen, Fourth edition, 2012) McGRAW Hill International Editions
ISBN: 978-007-108902-9 東華書局 02-23114027, 0933328278

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.)

其他補充說明 (Supplemental instructions)