



課 綱 Course Outline  
光電工程學系碩士班

中文課程名稱 Course Name in Chinese	半導體元件物理				
英文課程名稱 Course Name in English	Physics of Semiconductor Devices				
科目代碼 Course Code	OE_53100	班 別 Degree	碩士班 Master' s		
修別 Type	選修 Elective	學分數 Credit(s)	3.0	時 數 Hour(s)	3.0
先修課程 Prerequisite					
課程目標 Course Objectives					
Obtaining a basis for understanding the theory, characteristics, and operation of semiconductor devices.					
系教育目標 Dept.' s Education Objectives					
1	傳授科學知識，培訓實用技能。 Acquire science knowledge, develop practical skill				
2	培養工程倫理，啟發創新思維。 Sublimate engineering ethics, encourage creative thinking				
3	培養團隊精神，啟發獨創能力。 Develop the spirit of teamwork, and inspire the creative ability.				
4	提昇專業素養，拓展國際視野。 Develop professional ability, broaden global perspectives				
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	具有獨立研究能力 Equipped with abilities of independent research.			●	
B	具有光電工程的專業知識及應用能力。 Professional knowledge and application ability of Opto-electronic engineering			●	
C	具有設計與執行實驗、報告撰寫與數據解釋之能力。 Abilities to design and execute experiment, write reports, and explain data			○	

D	使用儀器進行物件的分析及測試。 Analysis and test of devices by instruments	○
E	具備適當的英文能力，應用於學習與交流。 English language ability to study and interac	●
F	具有良好的溝通與團隊合作的能力。 Ability to communicate and teamwork	
G	具有創新思維及終身學習的能力。 Creative thinking and life-long learning ability	●

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

課程大綱  
Course Outline

1. Introduction to Quantum Mechanics
2. Quantum Theory of Solids
3. Semiconductor in Equilibrium
4. Carrier Transport
5. Excess Carriers in Semiconductors
6. The pn Junction
7. The pn Junction Diode
8. Metal-Semiconductor and Heterojunctions

資源需求評估（師資專長之聘任、儀器設備的配合．．．等）  
Resources Required (e.g. qualifications and expertise, instrument and equipment, etc.)

No special requirement

課程要求和教學方式之建議  
Course Requirements and Suggested Teaching Methods

Lecture or Problems based learning

其他  
Miscellaneous