國立東華大學

教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	半導體元件物理			學年/學期 Academic Year/Semester	112/2
課程名稱(英文) Course Name in English	Physics of Semicond uctor Devices				
科目代碼 Course Code	OE__53100	系級 Department & Year	碩士	開課單位 Course-Offering Department	光電工程學系
修別 Type	選修 Elective	學分數/時間 Credit(s)/Hour(s)	3.0/3.0		
授課教師 Instructor	/林楚軒				
先修課程 Prerequisite					

課程描述 Course Description

This course includes
(1) Semiconductor Material and Physical Properties
(2) Fundamentals of pn-Junction Semiconductor Devices
This is an EMI (English as a Medium of Instruction) course.

課程目標 Course Objectives

Obtaining a basis for understanding the theory, characteristics, and operation of semiconductor devices.

	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 interact	●
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

授 課 進 度 表 Teaching Schedule & Content

週次Week	內容 Subject/Topics	備註Remarks
1	Introduction	
2	Quantum Mechanics(1/2)	
3	Quantum Mechanics(2/2)	
4	Quantum Theory of Solids (1/2)	

5	Quantum Theory of Solids (2/2)	
6	The Semiconductor in Equilibrium(1/3)	
7	The Semiconductor in Equilibrium(2/3)	
8	The Semiconductor in Equilibrium(3/3)	
9	Midterm evaluation	
10	Carrier Transport Phenomena	
11	Excess Carriers in Semiconductors (1/2)	
12	Excess Carriers in Semiconductors (2/2)	
13	The pn junction (1/2)	
14	The pn junction (2/2)	
15	The pn junction diode (1/2)	
16	The pn junction diode (2/2)	
17	Final Exam	Final evaluation
18	Video Study https://365ndhu-my.sharepoint.com/:f:/g/personal/chlin0109_o365_ndhu_edu_tw/Ei-Qjp1pid1Ckcxs_Cdu8YIByv2Tp12CKQ1aX1AE8rHITw?e=8Oymze	

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	40%			✓					
期中考成績 Midterm Exam	30%	✓							
期末考成績 Final Exam	30%	✓							
作業成績 Homework and/or Assignments									
其他 Miscellaneous (_____)									

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

General Performance is based on the Review Questions (get at least half of the points if you are in the class when you are drawn. The points would be deducted if you don't review in English)

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.)

1. Lecture Notes
2. Semiconductor Physics and Devices: Basic Principles, 4th edition,

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.)

Powerpoints and further information will be given on e-learn website
https://elearn4.ndhu.edu.tw/moodle/

其他補充說明 (Supplemental instructions)