國立台灣科技大學 114學年 第2學期　課程大綱

Spring 2026 NTUST Course Outline

授課教師：李寧

Instructor:Ling Lee

課程名稱：半導體元件物理

Course Title：Semiconductor Devices and Physics

2026/11/3

課程代號： TX4224302 Course Code 學分數： 3 Credits	必選修：必修/半學年 Required/Electve:Required/Half Yr. 先修課程： Prerequisites
節次教室： Time/Location	M3(TR-511) M4(TR-511) T6(TR-511)
專業核心能力： Core Professional Competencies	■1.具備運用數學、科學與工程知識以解決材料相關問題之能力。 ■4.明瞭實際生產流程，具備材料設計、製造與整合分析之能力。 ■6.具備發掘問題、邏輯分析、應用研究成果與因應複雜問題之能力。 ■7.明瞭科技趨勢，洞悉材料對工程與環境生態之影響，培養終身學習之能力。
課程網址： Course Website	N/A
課程宗旨： Course Objectives	This course helps to build up an overall understanding of the working principles of semiconductor devices. Physics and applications related to diodes, field effect transistors, light emitting diodes and laser, detectors, memory, and advanced design of devices will be covered in this course. Mathematical calculations will be important in understanding the underlying concept in the above-mentioned topics.
課程大綱： Outline of Lectures	1. Fundamental physics of semiconductor: capacitance and current 2. Digital circuit applications: switch 3. Analog circuit application: amplifier 4. Power device 5. High frequency application 6. Optoelectronics: light emitting diode and laser 7. Detector 8. Memory
授課方式： Method of Instruction	講授 Lecture：100% 分組討論 Group discussion：0% 案例研討 Case study：0% 操做練習 Practical exercises：0% 講授 Lecture：N/A%
教科書： Textbooks	Teacher-selected materials would be uploaded to Moodle system
參考書目： References	Teacher-selected materials would be uploaded to Moodle system
修課須知： Notice	Teaching materials would be uploaded to moodle.
評量方式： Grading	

	1st midterm exam 30% 2nd midterm exam 30% Final exam 30% in-class quiz 20%
備註說明： Notes	Fundamental materials science