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：葉雲鵬

Instructor:Yun Peng Yeh

課程名稱：智慧環境感測技術概論

Course Title：Smart Environment Sensor Technology

2026/11/4

課程代號：ME2901701 Course Code 學分數：3 Credits	必選修：選修/半學年 Required/Electve:Elective/Half Yr. 先修課程： Prerequisites
節次教室：W6(T3-301) W7(T3-301) W8(T3-301) Time/Location	
專業核心能力： Core Professional Competencies	核心能力1：運用數學、科學及工程知識的能力 核心能力2：規劃與執行實驗，並具解析數據之能力 核心能力3：執行工程實務所需技術、技巧及使用現代化工具的能力 核心能力4：設計機械系統、元件或製程的能力 核心能力6：能發掘、分析、應用研究成果及因應複雜且整合性工程問題的能力 核心能力7：認識時事議題，瞭解工程技術對環境、社會及全球的影響，並培養持續學習的習慣與能力，並具備外文閱讀的能力 核心能力8：體認及應用專業倫理，認知社會責任及尊重多元觀點
課程網址： Course Website	
課程宗旨： Course Objectives	隨著數位科技的發展，感測技術也日益精進,其應用領與已涵蓋了環境、安全、監視、工業應用、醫療診斷及公共衛生等領域，其技術及工作原理包括了物理、化學、光電等領域以及電工電子技術、機械製造技術、化學化工技術、生物技術等跨領域知識，未來亦有很大的發展空間。本課程內容包含了感測技術基本原理，包括物理，化學和光學感測技術。並學習機電感測系統，環境感測系統和生物感測系統等新型智能感測應用。透過這門課學生將獲得有關相關感測技術及系統應用的相關專業應用知識。 Sensors technology is relevant to virtually all aspects of life including safety, security, surveillance, monitoring, and awareness in general. Sensors are central to industrial applications being used for process control, monitoring, and safety as well as to medicine being used for diagnostics, monitoring, critical care, and public health. This lecture gives the fundamental knowledge and priciple of “sensing technology” include physical, chemical and optical sensing technologies. Then to learn the novel smart sensing applications in electromechanical system, environment system and biosensor technology. Students will gain combinational fundermental knowledge of sensor technology and system as well as their respective applications.
課程大綱： Outline of Lectures	

	智慧環境感測晶片及技術之種類、應用及發展。內容包括 Types, applications, and development of smart environmental sensing chips and technologies. The course content includes: 1. 感測技術簡介－介紹感測技術(1周) Introduction of Sensor Technology (1 week) 2. 感測技術簡介－感測層的運作原理與應用(1周) Sensing Principle (1 week) 3. 感測技術種類－物理感測器(2周) Sensor Types: Physical sensor (2 week) 4. 感測技術種類－化學感測器(2周) Sensor Types: Chemical Sensor (2 week) 5. 感測技術種類－光學感測器(2周) Sensor Types: Optical Sensor (2 week) 6. 感測技術應用－機電感測系統(2周) Sensor Applications: Electromechanical Sensor System (2 week) 7. 感測技術應用－環境感測系統(空氣感測系統、水資源感測系統)(2周) Sensor Applications: Environmental Sensor system (2 week) 8. 感測技術應用－生物感測系統(2周) Sensor Applications: Biosensor System (2 week) 9. 感測技術發展－智慧感測技術(2周) The development and application of sensor technology.
授課方式： Method of Instruction	講授 Lecture：80% 分組討論 Group discussion：10% 案例研討 Case study：10% 操做練習 Practical exercises：0% 講授 Lecture：%
教科書： Textbooks	1. Jon Wilson, Sensor Technology (2005). 2. Other books and lecture materials concerning sensor technology
參考書目： References	1. L.S. Grattan, B.T. Meggitt, Optical Fiber Sensor Technology, (1997)
修課須知： Notice	
評量方式： Grading	-Attendance出席 10% -Homework(2ea)作業(2份) 20% -Final report(1ea)期末報告(1份) 20% -Midterm Exam期中考試 25% -Final Exam期末考試 25%
備註說明： Notes	1.Lecture/Practice examples are for students to learn, so attendance is mandatory. 2.Homework assignments will be given, and are typically due one week later. 3.Submit Homework to Moodle system. Late submission of the homework assignments will reduce the score up to 50%. 4.Homework assignments must be done and written by each student himself or herself. 5.Project report is to study a specific topic assigned by the instructor and a well-typed report with formal format is required.