元智大學電機工程學系（丙組）「光機電系統與光資訊」深耕跨域學程科目規劃表

Department of Electrical Engineering (Program C), Yuan Ze University
"Optomechatronic System and Light Information" Advanced Cross-Domain Program
Course Planning Table
（115學年度申請適用)
(For students applied in Academic Year 2026)

115.04.29 一一四學年度第七次教務會議通過
Passed by the 7th Academic Affairs Meeting, Academic Year 2025, on April 29, 2026

一、教學目標 Teaching Objectives：

本學程旨在培育跨領域之光機電整合人才。舉凡當代先進顯示器、精密照明系統、及智慧感測成像，皆深度整合光學設計、精密機構與微電子系統。隨著工業 4.0 與人工智慧技術的普及，『智慧化光機電系統』已成為全球技術主流。本學程不僅規劃基礎的光學設計與光機電整合課程，更強調軟硬體協同開發之能力。在研發初期，學生需運用軟體進行光學模擬與機構設計；在系統實作階段，則導入人工智慧算法與機器學習技術，賦予系統具備自動化影像辨識、智慧量測與缺陷檢測之能力。

透過本學程之訓練，學生將具備光子學基礎、智慧程式撰寫及系統整合之專業專長，能無縫接軌光電產業、智慧製造及自動化設備研發領域，成為具備 AI 應用能力的跨領域光機電領航專家，全面提升未來職涯競爭力。

This program aims to cultivate interdisciplinary talents in Optomechatronic System Integration. In the era of Industry 4.0 and Artificial Intelligence (AI), the integration of optical design, precision mechanical engineering, and microelectronics has become the global technological mainstream—powering everything from advanced displays and precision lighting to intelligent sensing and imaging systems.

Beyond foundational courses in optical and optomechatronic design, this program emphasizes the cultivation of Hardware-Software Co-design capabilities. During the initial R&D phase, students are trained to utilize specialized software for optical simulation and mechanical modeling. In the implementation phase, AI algorithms and Machine Learning techniques are introduced to empower systems with automated image recognition, intelligent metrology, and defect detection capabilities.

Through this comprehensive training, students will acquire a solid foundation in photonics, expertise in intelligent programming, and mastery of system integration. Our graduates are well-prepared to bridge the gap between the photonics industry, smart manufacturing, and automated equipment R&D, emerging as pioneering optomechatronic experts with AI application skills and a competitive edge in their future career development.

二、課程設計 Curriculum Design:

必修課程：至少 12 學分
Required Courses: At least 12 credits

課號 Course ID	課程名稱 Course Name	學分 Credit(s)	學制 Degree structure	開課系所 Department Offered the Present Course(s)	備註 Remarks
EEC313	光電與產業 Photonics Industry	3	學士班 Undergraduate Program	電機系(丙組) Department of Electrical Engineering (Program C)	
EEC530	光電子學 Opto-Electronics	3	碩士班 Master Program	電機系(丙組) Department of Electrical Engineering (Program C)	二選一 Choose one of the two options
EEC301	光子學導論 Introductory Photonics	3	學士班 Undergraduate Program		

課號 Course ID	課程名稱 Course Name	學分 Credit(s)	學制 Degree structure	開課系所 Department Offered the Present Course(s)	備註 Remarks
EEC534	雷射原理與應用 Laser Principle and Application	3	碩士班 Master Program	電機系(丙組) Department of Electrical Engineering (Program C)	二選一 Choose one of the two options
EEC404	雷射導論 Introduction to Lasers	3	學士班 Undergraduate Program		
EEC511	光學設計 Optical Design	3	碩士班 Master Program	電機系(丙組) Department of Electrical Engineering (Program C)	二選一 Choose one of the two options
EEC213	光學設計導論 Introductory Optical Design	3	學士班 Undergraduate Program		

選修課程（組內）：至少 3 學分

Elective courses within program C : at least 3 credits

課號 Course ID	課程名稱 Course Name	學分 Credit(s)	學制 Degree structure	開課系所 Department Offered the Present Course(s)	備註 Remarks
EEC418	光電量測系統導論 Introduction of the optical metroiogy	3	學士班 Undergraduate Program	電機系(丙組) Department of Electrical Engineering (Program C)	
EEC422	非成像系統設計與實作 Introduction of the Simulation and Fabrication of Opto-Mechanical System	3	學士班 Undergraduate Program	電機系(丙組) Department of Electrical Engineering (Program C)	
EEC323	嵌入式系統之光電應用 Photonics Applications of Embedded Systems	3	學士班 Undergraduate Program	電機系(丙組) Department of Electrical Engineering (Program C)	
EEC414	色度學 Colorimetry	3	學士班 Undergraduate Program	電機系(丙組) Department of Electrical Engineering (Program C)	
EEC321	光電程式設計 Electro-Optics Programming	3	學士班 Undergraduate Program	電機系(丙組) Department of Electrical Engineering (Program C)	
EEC312	傅立葉變換及其應用 Fourier Transform Theory and Applications	3	學士班 Undergraduate Program	電機系(丙組) Department of Electrical Engineering (Program C)	
EEC322	色彩與影像處理 Color and Image Processing	3	學士班 Undergraduate Program	電機系(丙組) Department of Electrical Engineering (Program C)	
EEC514	傅立葉光學 Fourier Optics	3	碩士班 Master Program	電機系(丙組) Department of Electrical Engineering (Program C)	
EEC523	影像檢測技術 Image Inspection and Detection Technique	3	碩士班 Master Program	電機系(丙組) Department of Electrical Engineering (Program C)	
EEC329	感測器與其應用 Sensors and Their Applications	3	學士班 Undergraduate Program	電機系(丙組) Department of Electrical Engineering (Program C)	
EEC561	機器學習與其應用 Machine Learning and Its Applications	3	碩士班 Master Program	電機系(丙組) Department of Electrical Engineering (Program C)	
EEC563	人工智慧與其應用 Artificial Intelligence and Its Applications	3	碩士班 Master Program	電機系(丙組) Department of Electrical Engineering (Program C)	二選一 Choose one of the two options
EEC425	人工智慧與影像辨識 Artificial Intelligence and Image Identification	3	學士班 Undergraduate Program		
EEC308	電磁學（二） Electromagnetics(II)	3	學士班 Undergraduate Program	電機系(丙組) Department of Electrical Engineering (Program C)	
EEC330	光電工程實作 Optoelectronics Engineering Practices	2	學士班 Undergraduate Program	電機系(丙組) Department of Electrical Engineering (Program C)	二選一 Choose one of the two options
EEC328	工程光學實驗 Experiments in Photonic Engineering	1	學士班 Undergraduate Program		

選修課程（組外）：至少 3 學分
Elective courses outside program C : at least 3 credits

課號 Course ID	課程名稱 Course Name	學分 Credit(s)	學制 Degree structure	開課系所 Department Offered the Present Course(s)	備註 Remarks
EEB215	電腦視覺與影像處理概論 Introduction to Computer Vision and Image Processing	3	學士班 Undergraduate Program	電機系(乙組) Department of Electrical Engineering (Program B)	
EEB317	視窗程式設計 Windows Programming	3	學士班 Undergraduate Program	電機系(乙組) Department of Electrical Engineering (Program B)	
EEB340	智慧物聯網 AIoT Fundamentals	3	學士班 Undergraduate Program	電機系(乙組) Department of Electrical Engineering (Program B)	
EEB611	智慧物聯網高階實務 Advanced AIoT Practices	3	碩士班 Master Program	電機系(乙組) Department of Electrical Engineering (Program B)	
EEA494	物聯網應用技術與實作（一） IoT Ecosystem and Applications(I)	3	學士班 Undergraduate Program	電機系(甲組) Department of Electrical Engineering (Program A)	
EEA695	深度學習與視覺應用 Deep Learning and its Vision Applications	3	碩士班 Master Program	電機系(甲組) Department of Electrical Engineering (Program A)	
AI004	人工智慧導論 Introduction to Artificial Intelligence	3	學士班 Undergraduate Program	AI聯盟 AI Alliance	
AI002	人工智慧倫理 AI Ethics	3	學士班 Undergraduate Program	AI聯盟 AI Alliance	
AI001	機率與統計 Probability and Statistics	3	學士班 Undergraduate Program	AI聯盟 AI Alliance	三選一 Choose one of the 3 options
EEA223	工程機率 Probability for Engineers	3	學士班 Undergraduate Program	電機系(甲組) Department of Electrical Engineering (Program A)	
IE203	工程統計 Engineering Statistics	3	學士班 Undergraduate Program	工管系 Department of Industrial Engineering and Management	

三、學程證書授予標準Certificate Award Criteria：

1. 本組學生須修畢必修課程 12 學分、組內選修課程至少 3 學分，以及組外選修課程至少 3 學分。總計修滿 18 學分（含）以上者，將授予「光機電系統與光資訊」深耕跨域學程證書。
   Students in Program C of the Department of Electrical Engineering must complete a minimum of 18 credits, which include 12 credits of required courses, at least 3 credits of elective courses within the program, and at least 3 credits of elective courses from outside the program. Upon successful completion of these requirements, students will be awarded Certificate of the “Optomechatronic System and Light Information” Advanced Cross-Domain Program.
2. 須至少修習一門非學生所屬學系（組、班）之科目（不可包含與他系合開之課程）
   Students are required to take at least one course outside their own department (or program/class). (The courses co-offered with other departments are not included.)

四、領域別 Fields of Study：
人工智慧 Artificial Intelligence

五、學程召集人 Program Director：
陳念波 教授 Prof. Nien-Po Chen

六、負責規劃單位 Responsible Planning Unit：
電機工程學系(丙組) Department of Electrical Engineering (Program C)