

114.11.06.系課程委員會及 114.11.13院課程委員會審議通過  
114.12.4校課程委員會議及 114.12.23臨時教務會議審議通過

**第四學年Fourth Year (無必修課程No Department Required Courses)**

科目	Courses	上學期 First Semester			下學期 Second Semester		
		學分 Credits	正課 Lecture	實習 Internship	學分 Credits	正課 Lecture	實習 Internship
共同選修科目 General Elective Courses							
第一學年 First Year							
外語選修課程	Foreign language elective courses	2	2	0	2	2	0
外語菁英課程	Foreign Language Elite Courses	6	6	0	6	6	0
全民國防教育軍事訓練(一)	All-Out Defense Education Military Training (I)	1	2	0			
全民國防教育軍事訓練(二)	All-Out Defense Education Military Training (II)				1	2	0
第二學年 Second Year							
外語選修課程	Foreign language elective courses	2	2	0	2	2	0
外語菁英課程	Foreign Language Elite Courses	6	6	0	6	6	0
全民國防教育軍事訓練(三)	All-Out Defense Education Military Training (III)	1	2	0			
全民國防教育軍事訓練(四)	All-Out Defense Education Military Training (IV)				1	2	0
第三學年 Third Year							
外語選修課程	Foreign language elective courses	2	2	0	2	2	0
外語菁英課程	Foreign Language Elite Courses	6	6	0	6	6	0
體育選修	Physical Elective Course	1	2	0	1	2	0
全民國防教育軍事訓練(五)	All-Out Defense Education Military Training (V)	1	2	0			
第四學年 Fourth Year							
外語選修課程	Foreign language elective courses	2	2	0	2	2	0
外語菁英課程	Foreign Language Elite Courses	6	6	0	6	6	0
體育選修	Physical Elective Course	1	2	0	1	2	0
專業選修科目 Department Elective Courses							
第一學年 First Year							
多媒體遊戲暨智慧運算 Network Multimedia and Intelligent Computing							
機率與統計	Probability and Statics				3	3	0
第二學年 Second Year							
積體電路與系統應用 Integrated Circuit and System Application							
※VLSI 概論	Introduction to VLSI	3	3				
※半導體物理導論	Introduction to Semiconductor Physics	3	3				
●3D 列印導論與實務	3D Printing Introduction and Practice	3	3				
△※FPGA 系統設計	FPGA System Design	3	3				
光電元件導論	Introduction to Optoelectronic Devices	3	3				
全客戶 IC 佈局	Full Custom IC Layout				3	3	
半導體元件導論	Introduction to Semiconductor Devices				3	3	
微控制器系統實務	Practice of Microcontroller Based Embedded System				3	3	
[AI]人工智慧晶片導論	Introduction to AI on Chip				3	3	
半導體製程導論	Introduction to Semiconductor Processing				3	3	
印刷電路板製程技術與檢測	Printed Circuit Board Process Technology and Inspection				3	3	
多媒體遊戲暨智慧運算 Network Multimedia and Intelligent Computing							
△物件導向程式設計	Object-Oriented Programming	3	3				
△※工程軟體應用實作	Engineering Software Practice	2	1	3			
影像處理概論	Introduction to Image Processing	3	3				
3D 物件建模技術	3D Modeling Technology	3	3				
遊戲製作	Game Development				3	3	
※數位影像處理實作	Practice of Digital Image Processing				2	1	3
△※Python 程式設計	Programming in Python				3	1	2
※電腦圖學	Computer Graphics				3	3	
△單晶片微電腦應用實務	Microcomputer Application and Practice				2	1	3
資料結構	Data Structures				3	3	
智慧機器人 Intelligent Robotics							
工程圖學	Engineering Drawing	2	1	3			
※●工業機器人原理與應用	Principle and Application of Industrial Robots	3	3				
※電腦機構繪圖	Computer Aided Machine Drawing				3	3	
機構設計	Mechanism Design				3	3	
△單晶片微電腦應用實務	Microcomputer Application and Practice				2	1	3
第三學年 Third Year							
積體電路與系統應用 Integrated Circuit and System Application							
※類比積體電路設計	Analog IC Design	3	3				
積體電路製程	Integrated Circuit Manufacturing Process	3	3				
※嵌入式系統應用	Embedded System Application	3	3				
●電磁相容原理	Principle of Electromagnetic Compatibility	3	3				
半導體設備概論	Introduction to Semiconductor Equipment	3	3				
電路板製造與產業概論	Introduction to Circuit Board Manufacturing and Industry	3	3				
數位 IC 導論	Introduction to Digital IC	3	3				

電子封裝技術與材料	Advanced Packaging Materials and Processes	3	3				
機電概論	Introduction to Electromechanics	3	3				
半導體薄膜工程與元件	Semiconductor Thin Film Engineering and Components				3	3	
※低功耗積體電路設計	Low Power IC Design				3	3	
光電轉換導論	Introduction to Optical-Electrical Transfer				3	3	
高速 PCB 設計	High-Speed Printed Circuit Board Design				3	3	
電能轉換電路設計	Design of Power Conversion Circuits				3	3	
先進封裝材料與製程	Advanced Packaging Materials and Processes				3	3	
多媒體遊戲暨智慧運算 Network Multimedia and Intelligent Computing							
※網路概論	Introduction to Network	3	3				
△視窗程式設計	Windows Programming	3	3				
數位信號處理	Digital Signal Processing	3	3				
遊戲企劃	Game Design	3	3				
●△工業機器人程式設計	Industrial Robot Programming	3	3				
機器學習	Machine Learning				3	3	
[AI]人工智慧	Artificial Intelligence				3	3	
虛擬實境	Virtual Reality				3	3	
※嵌入式微處理器系統與實習	Embedded Microprocessor System and Practice				2	1	3
智慧機器人 Intelligent Robotics							
※●自動化系統整合與應用	Automation System Integration and Applications	2	1	3			
※●△機器人程式設計(1)-初階工程師	Robot Software Programming (1) - Junior Engineer	3	3				
嵌入式微處理器系統與實習	Embedded Microprocessor System and Practice	2	1	3			
控制系統	Control System	3	3				
※機器視覺	Machine Vision				3	3	
自動化光學檢測概論	Introduction to Automatic Optical Inspection				3	3	
※智慧感測與監控實務	Smart Sensor and Supervisory Control Practice				2	1	3
電力電子學	Power Electronics				3	3	
第四學年 Fourth Year							
積體電路與系統應用 Integrated Circuit and System Application							
材料科學概論	Introduction to Material Science	3	3				
射頻積體電路導論	Introduction to RFIC Design	3	3				
※電力電子積體電路設計	Power Electronics IC Design	3	3				
太陽能系統與應用	Solar Cell System and Application	3	3				
△※嵌入式軟體設計實務	Embedded Software Design and Practice	3	3				
●電磁相容之標準與測試	Electromagnetic Compatibility of Standards and Test	3	3				
複合材料導論	Introduction to Composite Materials	3	3				
先進半導體製程整合	Advanced Semiconductor Process Integration	3	3				
生醫感測器概論	Introduction to Biosensor Devices				3	3	
半導體元件模擬	Semiconductor Device Simulation				3	3	
電磁相容實務	Practice of Electromagnetic Compatibility				3	3	
記憶體元件	Memory Devices				3	3	
微波工程導論	Introduction to Microwave Engineering				3	3	
IC 測試技術	IC Testing Technology				3	3	
IC 封裝技術	IC Package Technology				3	3	
運算放大器設計實務	Practical Design of Operational Amplifiers				3	3	
奈米科技導論	Introduction to Nanotechnology				3	3	
多媒體遊戲暨智慧運算 Network Multimedia and Intelligent Computing							
資料庫系統應用	Database System Application	3	3				
作業系統	Operating System	3	3				
計算機結構	Computer Architecture	3	3				
遊戲物理導論	Introduction to Game Physics	3	3				
虛實整合製作	Extended Reality Development	3	1	2			
深度學習應用	Applied Deep Learning	3	3				
●數位成音(一)	Digital Audio (I)	3	3				
●數位成音(二)	Digital Audio (II)				3	3	
演算法	Algorithms				3	3	
3D 動畫技術	3D Animation Technology				3	3	
物聯網概論	Introduction to Internet of Things				3	3	
△雲端科技應用	Applied Cloud Computing				3	3	
△※嵌入式系統開發實習	Embedded System Development and Practice				2	1	3
智慧機器人 Intelligent Robotics							
機器學習	Machine Learning	3	3				
自動化圖控介面	Automatic Graphical Control Interface	3	3				
可攜式電源設計	Portable Power Supply Design	3	3				
[AI]深度學習	Deep Learning				3	3	
工業無線通訊技術	Industrial Wireless Communication Technology				3	3	
※●△機器人程式設計(2)-中階工程師	Robot Software Programming (2) - Intermediate Engineer				3	3	

自動化設備設計與組裝	Automation Equipment - Design and Assembly				3	3	
光機電整合	Photo-Electrical and Mechanical Integrated Technology				3	3	

共同專業選修科目 Department General Elective Courses							
第一學年 First Year							
電子工程概論	Introduction to Electronic Engineering	3	3	0			
電子科技英文	English for Electronics and Technology	3	3	0			
產業概論	Introduction to Industrial				3	3	0
第二學年 Second Year							
校外實習(寒假)一	Internship on Winter Vacation (I)	1	0	1			
校外實習(暑期)一	Internship on Summer Vacation (I)	3	0	3			
電子產業實習英文	Practical English for Electronic Industry	3	3	0			
監控系統設計及實習	SCADA Design and Practice	3	2	2			
通信電子學	Fundamentals of Electronic Communication				3	3	0
師徒實務專題(一)	Mentor-Apprentice Project Study (I)				3	0	3
第三學年 Third Year							
產業論壇	Industry Forum	3	3	0			
電磁學	Electromagnetics	3	3	0			
校外實習(寒假)二	Internship on Winter Vacation (II)	1	0	1			
校外實習(暑期)二	Internship on Summer Vacation (II)	3	0	3			
智慧電能儲存技術	Smart Technologies for Electrical Energy Storage System	3	3	0			
高頻電路設計	RF Circuit Design				3	3	0
電磁波	Electromagnetic Waves				3	3	0
職場倫理論壇	Workplace Ethics Forum				3	3	0
第四學年 Fourth Year							
師徒實務專題(二)	Mentor-Apprentice Project Study (II)	3	0	3			
雷射原理與應用	Principle and Application of Laser	3	0	3			
RFID 技術	RFID Technology	3	3	0			
專業倫理與社會責任	Professional Ethics and Social Responsibility	3	3	0			
校外實習(寒假)三	Internship on Winter Vacation (III)	1	0	1			
校外實習(暑期)三	Internship on Summer Vacation (III)	3	0	3			
職場倫理實習(一)	Workplace Ethics Practice (I)	3	0	3			
資訊技術實習(一)	Computer Application Practice (I)	3	0	3			
電子技術實習(一)	Electronic Skill Practice (I)	3	0	3			
產業實務實習(一)	Industrial Practice Internship (I)	3	0	3			
信號完整性	Signal Integrity				3	3	0
職場倫理實習(二)	Workplace Ethics Practice (II)				3	0	3
資訊技術實習(二)	Computer Application Practice (II)				3	0	3
電子技術實習(二)	Electronic Skill Practice (II)				3	0	3
產業實務實習(二)	Industrial Practice Internship (II)				3	0	3

備註 Note:

一、畢業至少應修滿 128 學分【必修 75 學分，選修至少 53 學分(須含本系專業選修至少 36 學分)】

Students should complete at least 128 credits before graduation, includes 75 required credits, 53 elective credits (elective credits should have at least 36 credits from department elective courses).

二、本校訂有「國立勤益科技大學學生畢業門檻辦法」，畢業門檻條件：英文能力及自主學習，請依規定辦理。

Our school has established the "National Chin-yi University of Science and Technology Student Graduation Threshold Measures", Graduation threshold: English proficiency and independent study, please follow the regulations.

三、博雅通識課程三大領域中，每一領域至少各修習一門課程，學分總計至少 10 學分。每門課程學分數(時)為 2 學分 2 學時或 3 學分 3 學時。

Among the 3 core areas of liberal education curriculum, students should take 10 or more credits in 3 different areas. The credit hours for each course are either 2 hours course with 2 credits or 3 hours course with 3 credits..

四、本系畢業門檻一：學生要修讀多媒體遊戲暨智慧運算領域「※必選課程」其中的三門，為其畢業之基本條件。

Three of the required courses(※) offered in the Network Multimedia and Intelligent Computing Field must be taken for satisfying the first graduation criteria.

五、本系畢業門檻二：學生要取得本系開設之下述「領域」至少一個，為其畢業之基本條件。學生至少要獲得 21 學分、或獲得 7 門課的學分，才能視為取得此領域證明。「※必選課程」，須至少選二門。

- (一)積體電路與系統應用領域
- (二)多媒體遊戲暨智慧運算領域
- (三)智慧機器人領域

At least one of the following fields must be fulfilled for satisfying the second graduation criteria. Students taking this field are requested to obtain a minimum of 21 credits, including at least 2 required courses to be taken for this field certificate.

- (1) Integrated Circuit and System Application Field
- (2) Network Multimedia and Intelligent Computing Field
- (3) Intelligent Robotics Field

六、必選課程為選修，不及格者不必重修、或補修。

Every required course is elective. Failure of these courses is not necessary to re-take for graduation.

七、課程名稱前有標示「●」符號者，為「職能專業課程」。

Courses with a “●” refer to a professional competence course.

八、課程名稱前有標示「AI」符號者，為「人工智慧相關課程」。

Courses with an “AI” refer to an artificial intelligence related course.

九、課程名稱前有標示「△」符號者，為程式設計課程。

Courses with a “△” refers to an application design course.

十、學生須選讀至少一門本系所訂定之跨領域學程課程，並有成績登錄。

Students need to register for at least one the course of inter-disciplinary program set by this department and have a record of grades.

智慧製造			半導體		
課程選別	學年	課程名稱(學分/學時)	課程選別	學年	課程名稱(學分/學時)
必修	二上	微處理機實習 2/4	必修	二上	電子學(一) 3/3
必修	二下	信號與系統 3/3	必修	二下	電子學(二) 3/3
選修	二下	Python 程式設計 3/3	選修	二上	VLSI 概論 3/3
選修	三上	機器人控制 3/3	選修	二上	半導體物理導論 3/3
外系選修	四上	智慧機電實務 3/3	外系選修	二下	全客戶 IC 佈局 3/3
外系選修	四下	物聯網概論 3/3	外系選修	三上	半導體設備概論 3/3

十一、為因應法規變更、評鑑建議或政府計畫規定等外在因素，本系保有調整學分計畫之權利。若有修訂，將於學期開始前公告，並明確說明修訂內容、影響範圍及相關配套措施，以保障學生權益。

The department reserves the right to adjust the curriculum in response to external factors such as changes in regulations, suggestions of evaluation and accreditation, or government program regulations. If there are any revisions, will be announced before the start of the semester, and the revised content, scope of impact, and related supporting measures will be clearly stated to protect the rights and interests of students.