

長庚大學 電子工程系 大學部必選修科目表 (113學年度入學學生適用)

Curriculum of the Bachelor's program of Dept. Electronic Engineering, Chang Gung University (applicable to students admitted in 2024)

	科目名稱	一			科目名稱	二			科目名稱	三			科目名稱	四	
		1	2	暑		1	2	暑		1	2	暑		1	2
必修 Compulsory courses	專業	微積分(Calculus)(1)(2)	3	3	電路學(二)(Electric Circuits)(2)	3		電磁學(Electromagnetics)(1)(2)	3	3	專題研究(Seminar)(2)	1			
		普通物理學(1)(2)(General Physics)(1)(2)	3	3	電子學(Electronics)(1)(2)	3	3	電子學(Electronics)(3)	3						
		普通物理學實驗(General Physics Laboratory)(1)(2)	1	1	電子電路實驗(Microelectronic Circuit Laboratory)(1)(2)	1	1	超大型積體電路設計導論(Introduction to VLSI Design)	3						
		普通化學(General Chemistry)	3		工程數學(微分方程)(Engineering Math: Partial Differential Equations)	3		電子電路實驗(3)(Microelectronic Circuit Laboratory)(3)	1						
		普通化學實驗(General Chemistry Laboratory)	1		近代物理(Modern Physics)	3		專題研究(Seminar)(1)		1					
		計算機概論(Introduction to Computer Science)	3		電子工程概論(Introduction to Electronic Engineering)	1									
		邏輯設計(Logic Design)	3		半導體元件物理學(Semiconductor Device Physics)	3									
		電路學(一)(Electric Circuits)(1)		3											
		工程數學(線性代數)(Engineering Mathematics (Linear Algebra))		3											
程式設計(Computer Programming)		3													
選修 elective courses	院共構課程						英文口說與報告(1)(2)English Speaking and Presentation(1)(2)	2	2						
	共同選修				電子學(一)演練(Exercise of Electronics)(1)	1		海外研習(Overseas Study)	1		校外實習(Practice School)	4			
											企業實習(1)(2)Industry	6	6		
	電子智慧 學程	創意生醫感測電子實驗(Creative Biomedical Sensing Electronics and Experiments)		3	印刷電路板之系統整合設計暨實作(System Integration Design of PCB and Its Implementation)	3		嵌入式系統設計與實作(Design and Implementation of Embedded Systems)		4					
		FPGA實作(FPGA Lab)		3				類比積體電路實作(Analog IC design)		3					
四大領域專業 選修 major elective courses	高頻通訊 電子領域 課程				訊號與系統(Signal & System)	3		通訊原理(Communication Theory)	3		通訊積體電路設計(Design of Integrated Circuit for	3			
					向量分析與複變函數(Vector Analysis and Complex Variable)	3		數值方法(Numerical Method)	3		被動微波電路設計(Passive Microwave Circuit Design)	3			
					印刷電路板之系統整合設計暨實作(System Integration Design of PCB and Its Implementation)	3		通訊電子學(Communication Electronics)	3		元件量測與可靠性 Devices Measurement and Reliability	3			
								通訊設計實驗(Communication Design Laboratory)	1		電波工程(Electromagnetic Wave Engineering)	3			
								數位通訊 (Digital Communication)	3		光纖通訊(Optical Fiber Communications)	3			
								工程數學(機率與統計)(Engineering Mathematics-Probability and Statistics)	3		高頻電路設計(High Frequency Circuit Design)	3			
								電波工程實驗(Wave Propagation Experiments)	1		微波濾波器設計(Microwave Filter Design)	3			
								類比積體電路實作(Analog IC design)	3		醫療電子臨床導入(Clinical Application of Medical Electronic	3			
											生醫植入晶片系統專題(Projects in Implantable Bio-System-on-a- 天線(Antennas)	3			
											數位通信積體電路設計(Digital Communication Integrated Circuit Design)	3			
人工智慧 與晶片系統 領域課程	創意生醫感測電子實驗(Creative Biomedical Sensing Electronics and Experiments)		3	資料結構(Data Structure)	3		微處理器(Microprocessor)	3		類比積體電路(Analog Integrated Circuit Design)	3				
	FPGA實作(FPGA Lab)		3	數位系統設計(Digital Circuits and Systems)	3		通訊原理(Communication Theory)	3		通訊積體電路設計(Design of Integrated Circuit for Telecommunication)	3				
				數位系統設計實驗(Digital Circuits and Systems Laboratory)	1		數位訊號處理(Digital Signal Processing)	3		元件量測與可靠性 Devices Measurement and Reliability	3				
				計算機組織(Computer)	3		數值方法(Numerical Method)	3		生醫電子學(Biomedical DIP設計概論(Advanced DIP	3				
				訊號與系統(Signal & System)	3		積體電路設計實驗(IC Design Lab)	1		醫療電子臨床導入(Clinical Application of Medical Electronic	3				
				向量分析與複變函數(Vector Analysis and Complex Variable)	3		微處理器實驗(Microprocessor Experiments)	1		數位通信積體電路設計(Digital Communication Integrated Circuit Design)	3				
				印刷電路板之系統整合設計暨實作(System Integration Design of PCB and Its Implementation)	3		工程數學(機率與統計) (Engineering Mathematics- Probability and Statistics)	3		數位通信積體電路設計(Digital Communication Integrated Circuit Design)	3				
							電波工程實驗(Wave Propagation Experiments)	1		數位積體電路設計(Digital Integrated Circuit Design)	3				
量子物理(Quantum Physics)	創意生醫感測電子實驗(Creative Biomedical Sensing Electronics and Experiments)		3	材料科學導論(Introduction to Material Science)	3		材料結構與特性(Structures and Properties of Materials)	3		量子物理(Quantum Physics)	3				
				固態物理導論(Introduction to Solid State Physics)	3		光電材料(Optical Semiconductor Materials)	3		材料分析(Material Analysis)	3				
				向量分析與複變函數(Vector Analysis and Complex Variable)	3		半導體實驗(Semiconductor Experiments)	1	1	奈米材料與元件(Nanostructured and Nanotechnology)	3				

奈米材料製程領域課程								半導體製程(VLSI Technology)		3		元件量測與可靠性 Devices Measurement and	3
								工程數學(機率與統計)(Engineering Mathematics- Probability and Statistics)		3		非揮發性記憶體元件與製程 (Nonvolatile Memories and Their Fabrication Technologies)	3
								半導體元件設計(Semiconductor Device Design)		3		液晶顯示器薄膜製程技術 (Liquid-Crystal Displays Thin Film Process Technology)	3
								電路板基礎工程(Fundamentals and Engineering of Printed Circuit board industry)		3		醫療電子臨床導入(Clinical Application of Medical Electronic Device)	3
								數值方法(Numerical Method)		3		微機電元件與系統(Micro-electromechanical Device and	3
												太陽能晶片與系統專題(Topics on Solar Cell Chip and System)	3
												半導體製造科技(Semiconductor Manufacturing Technology)	3
												半導體元件製造與發展實務 (Semiconductor Device Fabrication and Development Practice)	3
												半導體元件物理及特性(Physics and Characterization of Semiconductor Devices)	3
											專案實習(Internship to Industry Related Project)	4	
綠能照明領域課程						材料科學導論(Introduction to Material Science)	3	材料結構與特性(Structures and Properties of Materials)	3			光電實驗(Electro-Optical Laboratory)	1
						固態物理導論(Introduction to Solid State Physics)	3	光電材料(Optical Semiconductor Materials)	3			量子物理(Quantum Physics)	3
							3	半導體製程(VLSI Technology)	3			光學(Optics)	3
								半導體實驗(Semiconductor Experiments)	1	1		元件量測與可靠性 Devices Measurement and	3
								工程數學(機率與統計)(Engineering Mathematics (Probability and Statistics)	3			基礎群論(Basic Group Theory)	3
								電路板基礎工程(Fundamentals and Engineering of Printed Circuit board industry)	3			材料分析(Material Analysis)	3
								數值方法(Numerical Method)	3			雷射物理(Laser Physics)	3
												醫療電子臨床導入(Clinical Application of Medical Electronic	3
												太陽能晶片與系統專題(Topics on Solar Cell Chip and System)	3
												半導體製造科技(Semiconductor Manufacturing Technology)	3
												半導體元件製造與發展實務 (Semiconductor Device Fabrication and Development Practice)	3
												半導體元件物理及特性(Physics and Characterization of Semiconductor Devices)	3
												專案實習(Internship to Industry Related Project)	4

備註 Remark

一、I. 1. 畢業學分：129學分。1. Graduation credits: 129 credits
 (1) 必修69學分。(1) 69 credits of compulsory courses
 (2) 選修31學分：(2) 31 credits of elective courses
 a. 系選修至少24學分。a. At least 24 credits of elective courses in the Department of Electronics Engineering.
 b. 選修他系課程至多承認7學分(通識課程、體育及全民國防教育軍事訓練選修課程不予列入)。
 b. A maximum of 7 credits can be admitted for elective courses from other departments (General education, physical education, and military training elective courses are not included).
 c. 學院共構選修課程列入他系選修。c. The college co-constructed courses are counted as electives of other departments.
 (3) 通識學分：請詳見通識中心修課規定，英文領域、核心、多元課程29學分。(3) General Education Credits: Please refer to the course requirements of Center for General. 29 credits of English related, core, and diverse courses.
 2. 體育大一、大二必修0學分。2. It requires 0 credits for compulsory physical education.
 3. 【深耕學園】必修0學分，請詳見學務處深耕學園專區說明。3. Compulsory "Sprout Campus" 0 credits, please refer to the description of the "Sprout Campus" from Office of Student Affairs for details.
 4. 本校訂有英文畢業門檻，須達校訂標準方可畢業，請詳見語文中心規定。4. Students must meet the criteria of English Proficiency Assessment before graduation. Please refer to the regulations of the Language Center for details.
 5. 選修電機系「計算機組織」、「資料結構」可承認為電子系四大專業領域選修學分。5. Select "Computer Organization" and "Data Structure" from the department of electrical engineering as elective credits within the four major fields in the department of electronics engineering .

二、II. 必、選修學分：(常規學期或暑期學制二擇一) Compulsory and elective credits: Can only choose one of the regular or summer academic
 ◆ 常規學制：必修69學分、選修31學分(含系選修至少24學分、自由學分至多7學分)、通識29學分 Regular academic system: 69 credits for compulsory courses, 31 credits for elective courses (including at least 24 credits for EE elective courses and at most 7 credits for free elective courses), 29 credits for general education.
 1. 必修69學分。69 compulsory credits .
 2. 系定專業選修分為四大領域「高頻通訊電子領域」、「人工智慧與晶片系統領域」、「奈米材料製程領域」、「綠能照明領域」，系選修必須包含二個專業選修領域(四選二)，且每領域至少9學分，應通過一門選修實驗課。EE elective courses are divided into four major fields: Group A, Group B, Group C, and Group D. EE elective courses must include two major areas (choose two of the four), and each area must have at least 9 credits and complete one elective experimental courses .

3. 選修他系課程至多承認7學分(通識課程、體育及全民國防教育軍事訓練選修課程不予列入)。A maximum of 7 credits can be admitted for elective courses from other departments (General education, physical education, and military training elective courses are not included).
4. 企業實習(1)、(2)最多承認為選修學分6學分。"Industry Training" (1) and (2) can be recognized as elective credits at most 6 credits.
5. 暑期學程學分可列為常規學期之專業領域選修學分(含選修實驗課程)，「創意生醫感測電子實驗」得認列為一門選修實驗課。The credits of the "e-Wise Development Program" can be listed as elective credits (including elective experimental courses) in the major field of the regular semester, and "Creative Biomedical Sensing Electronics and Experiments" can be recognized as an elective experimental course.
6. 學生需先完成海外交換學習歸國後，始可選修本「海外研習」課程。Students need to complete the overseas exchange study and return to CGU before they can take the "Overseas Study" course.

◆ 暑期學制：必修68學分、選修32學分(含系定專業選修至少10學分及學程選修15學分、自由學分至多7學分)、通識29學分 Summer academic system: 68 credits for compulsory courses, 32 credits for elective courses (including at least 10 credits for EE elective courses and 15 credits "e-Wise Development Program" elective courses, at most 7 credits for free elective courses), 29 credits for general education.

1. 必修68學分，抵免「專題研究(2)」之替代課程，必須取得下列暑期學程課程學分。Compulsory 68 credits. The credits of the following "e-Wise Development Program" courses are required for the alternative courses of "Seminar (2)".

(1) 「跨領域實務專題」(1) "Interdisciplinary Special Project"

(2) 「嵌入式系統設計與實作」、「類比積體電路實作」(二擇一) (2) "Design and Implementation of Embedded Systems", "Analog IC design" (choose one of the two)

2. 系定專業選修分為四大領域「高頻通訊電子領域」、「人工智慧與晶片系統領域」、「奈米材料製程領域」、「綠能照明領域」，系選修至少需包含一個專業選修領域(四選一)，且該領域至少須修滿9學分系選修暨電子智慧學程，應通過一門選修實驗課。EE elective courses are divided into four major fields: Group A, Group B, Group C, and Group D. EE elective courses must include one major areas (choose one of the four), the chosen field must take at least 9 credits of EE electives and "e-Wise Development Program" courses, and complete one elective experimental courses.

3. 「電子智慧學程」應修滿15學分。At least 15 credits of "e-Wise Development Program" courses.

4. 選修他系課程至多承認7學分(通識課程、體育及全民國防教育軍事訓練選修課程不予列入)。A maximum of 7 credits can be admitted for elective courses from other departments (General education, physical education, and military training elective courses are not included).

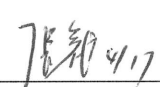
5. 「創意生醫感測電子實驗」得認列為一門選修實驗課。"Creative Biomedical Sensing Electronics and Experiments" is admitted as an elective experimental course.

6. 未完成暑期學程者，其暑期學程學分可列為常規學期之專業領域選修學分(含選修實驗課)。For those who have not completed the "e-Wise Development Program", their credits can be admitted as elective credits in the major field of the regular semester (including elective experimental courses).

三、III. 擋修課程：Prerequisite courses:

1. 大二「工程數學(微分方程)」先修課程為大一「微積分(2)」達60分。"Calculus (2)" is prerequisite for "Engineering Math: Partial Differential Equations".
2. 大二「數位系統設計」先修課程為大一「邏輯設計」達60分。"Logic Design" is prerequisite for "Digital Circuits and Systems".

系主任簽章：

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