

# 國立交通大學電機工程學系「跨域學程」實施要點

## National Chiao Tung University Department of Electrical and Computer Engineering Implementation Guidelines for Cross-Disciplinary Program

106年3月22日電機系務會議通過  
106年3月15日電機系課程委員會通過

- 一、依據國立交通大學跨域學程實施辦法，國立交通大學電機工程學系(以下簡稱本系)為鼓勵學生進行跨領域學習，建立跨域學習深度，協助學生拓展第二專長，提供學生可以在畢業學分不增加(或僅少量增加)情況下，修畢跨域學程，特訂定本要點。

Article One These Implementation Guidelines are prescribed by National Chiao Tung University Department of Electrical and Computer Engineering(hereinafter referred to as Our Department) based on NCTU Cross-Disciplinary Program Implementation Regulations to provide the opportunity for students to proceed cross-disciplinary learning without increasing graduate credits (or only a few extra credits) in order to encourage students to conduct cross-disciplinary study, build the depth of cross-disciplinary study, and assist students to expand second specialty.

- 二、跨域學程係指由交通大學的學系、研究所、或學院提出模組課程，模組課程應包含該領域基礎核心知識，且總學分數以 30 學分為原則(最低可為 28 學分，最高不可超過 32 學分)，學生修習跨域學程，其課程將包含所屬學系的跨域學程模組課程以及第二專長系所或學院的跨域學程模組課程，並可於畢業證書上加註第二專長模組課程為「跨域專長」。

Article Two The cross-disciplinary program here means the cross-disciplinary module curriculum proposed by the departments, institutes or colleges in National Chiao Tung University. Module curriculum should include the core knowledge curriculum of the field and the total credits will be based on 30 credits (the minimum 28 credits and no more than 32 credits). The cross-disciplinary program that students take will include the cross-disciplinary program module curriculum of the department they belong to as well as the cross-disciplinary program module curriculum from the second specialty department or college. The module curriculum of the second specialty could be remarked as “Cross-Disciplinary Specialty” on the diploma.

### 三、本要點修業規定

Article Three Policies of these Guidelines

1. 適用對象：本系 104 學年度之後入學之學士班學生均適用本要點。
1. The policy is only for students of our department admitted from the academic year 2015.
2. 本系學生欲修習跨域學程者
2. For the student of our department who would like to take cross-disciplinary program
  - (1) 得於大一下學期或大二下學期向本系提出申請，申請時註明欲申請的第二專長系所或學院，申請期限將由本系課程委員會提前一個月進行公告，公告中說明需準備的審查資料以及當年度本系開放給本系學生修讀跨域學程的名額，申請案經本系課程委員會審查通過後，需送到第二專長系所或學院審查，通過雙邊審查後，方

可進入跨域學程。

- (1) The application could be submitted to our department during the second semester of the first year or the second semester of the second year. The department or college of the second specialty that the student would like to apply for must be remarked on the application form, and the application deadline would be announced one month in advance by the Curricular Committee at our department. The information of evaluation documents needed to be prepared as well as the quota opened to the students of our department to study for this program in the given year will be released on the announcement. The application should be sent to the department or college of the second specialty for evaluation after it is approved by the Curricular Committee at our department. Students could only take the cross-disciplinary program after evaluation by both sides.
  - (2) 本系學生修習跨域學程的課程，列示於『電機工程學系跨域學程本系學生必修科目表』，其課程包含:校必修(含共同必修 28 學分)，本系基礎必修課程，本系跨域模組課程，以及第二專長系所或學院的跨域模組課程(以下簡稱他系跨域模組課程)，畢業學分以 128 學分為原則。他系跨域模組課程認定為跨域專長，於畢業證書本系名稱後加註此跨域專長。
  - (2) The courses of cross-disciplinary program studied by students in our department should be listed on “The Required Course List for the students at our department study cross-disciplinary program in Department of Electrical and Computer.” The courses include required courses of the university (including 28 credits of general education subjects), core curriculum at our department, cross-disciplinary module curriculum at our department, and the cross-disciplinary module curriculum of the second specialty department or college (hereinafter referred to as cross-disciplinary module curriculum at other department) with at least 128 graduate credits. The cross-disciplinary module curriculum at other department would be recognized as cross-disciplinary specialty, and it will be remarked after the title of our department on the diploma.
  - (3) 本系學生修習跨域學程，若無法修畢跨域學程課程，得選擇放棄跨域學程，改修習原電機工程學系的學士學位課程。
  - (3) For students at our department who study for cross-disciplinary program but are not able to complete the program, they shall give up the cross-disciplinary program and transfer to study for the bachelor degree program at the original Department of Electrical and Computer.
3. 外系學生欲修習跨域學程且選擇本系做為其跨域專長者
  3. For students of other departments who would like to study for cross-disciplinary program and choose our department as their cross-disciplinary specialty
    - (1) 得於大一下學期或大二下學期向其所屬學系（以下簡稱原系）提出申請，通過原系以及本系的雙邊審查後，方可進入跨域學程。
    - (1) They could submit the application to the department that they belong to during the second semester of the first year or the second semester of the second year, they could only take

the cross-disciplinary program after approved by both their original department and our department.

- (2) 外系學生修讀跨域學程且選擇本系做為其跨域專長者，其課程包含：校必修(含共同必修 28 學分)，原系基礎必修課程，原系跨域模組課程，以及列示於『電機工程學系跨域模組課程必修科目表』的模組課程，畢業學分以 128 學分為原則，並於畢業證書原系名稱後加註電機工程為其跨域專長。
- (2) The courses for the students of other departments who would like to study for cross-disciplinary program and choose our department as their cross-disciplinary specialty include required courses of the university (including 28 credits of general education subjects), core curriculum at their original department, cross-disciplinary module curriculum at their original department, and the module curriculum listed on “The Required Course List for the students study cross-disciplinary module curriculum in Department of Electrical and Computer” with at least 128 graduate credits. The Department of Electrical and Computer will be remarked as their cross-disciplinary specialty after the title of their original department on the diploma.

四、本系指定一名專任教師擔任跨域學程導師，與外系所或學院的跨域學程導師組成導師群，專責輔導跨域學程的學生。

Article Four Our department assigned one full-time teacher to be the mentor of the cross-disciplinary program and formed mentor group with teachers of cross-disciplinary program at other department or college to give guidance to cross-disciplinary program students.

五、為鼓勵不同系所或學院合作提出跨域共授課程，由兩位以上教師開授跨領域之創新整合式課程，得依本校教師授課鐘點核計原則第九條第六款規定，教師的授課鐘點數可按到場時數計，但以開課前該門課程之實際簽呈為依據。

Article Five In order to encourage different departments or colleges working together for the proposal of cross-disciplinary curriculum, the number of teaching hours for the innovating integrated curriculum offered by more than two teachers could be calculated by the actual time of teaching according to Subparagraph 6, Article 9 of National Chiao Tung University Teaching Hours Accounting Principle; however, it will be in accordance with the official approval of the curriculum before the course starts.

六、本要點如有未盡事宜，悉依本校學則及其他相關規定辦理。

Article Six If there is any unaccomplished matter of these guidelines, it shall be handled in accordance with the school constitution of our university as well as other relevant regulations.

七、本要點經校級課程委員會通過並提教務會議核備後實施，修訂時亦同。

Article Seven These guidelines were approved by Curricular Committee at university level and then submitted to the Council of Academic Affairs for approval-for-reference before putting it into practice; the same shall be done upon any amendment thereto.

電機工程學系「跨域學程」本系學生必修科目表(A)

The Required Courses List for the students at our department study  
Cross-disciplinary Program in ECE Department

類別 Category	選別 Classification	科目名稱 Courses	學分 Credits	開課系所 Dept.	備註 Remarks
本系基礎必修 (54 學分) Core curriculum at our department (54 credits)	基礎必修課程 (54 學分) Fundamental Compulsory Courses (54credits)	微積分(一) Calculus (I)	4	電機系 ECE	
		微積分(二) Calculus (II)	4	電機系 ECE	
		物理(一) General Physics (I)	4	電機系 ECE	
		物(二) General Physics(II)	4	電機系 ECE	
		線性代數 Linear Algebra	3	電機系 ECE	
		微分方程 Differential Equation	3	電機系 ECE	
		生涯規劃 Career Planning	1	電機系 ECE	
		服務學習(一) Student Service Education (I)	0	電機系 ECE	
		服務學習(二) Student Service Education (II)	0	電機系 ECE	
		電路學 Circuit Theory	3	電機系 ECE	
		電磁學(一) Electromagnetics(I)	3	電機系 ECE	
		電磁學(二) Electromagnetics(II)	3	電機系 ECE	
		電子學(一) Electronics (I)	3	電機系 ECE	
		電子學(二) Electronics (II)	3	電機系 ECE	
		電子實驗(一) Electronics Labs (I)	2	電機系 ECE	
		電子實驗(二) Electronics Labs (II)	2	電機系 ECE	
		訊號與系統 Signals and Systems	3	電機系 ECE	
		計算機概論與程式設計 Intro. to Computers and Programming	3	電機系 ECE	
		邏輯設計與實驗 Logic Design and Lab	3	電機系 ECE	
		微算機原理與實驗 Principle of Microcomputer	3	電機系 ECE	

專業選修領域 Elective Courses in Professional Programs	應從 10 個領域自行選擇一個主修領域及該領域至少 1 門必選修、3 門選修及 1 門實驗課，修滿至少 15 學分。 You are required to choose 1 programs from 10 different programs, and take at least 1 Required elective courses, 3 elective courses, and 1 Lab from that program. At least 15 credits.			
系統控制 System Control	複變函數 Complex Variables	3	電機系 ECE	必選修 Required elective courses
	機率 Probability	3	電機系 ECE	必選修 Required elective courses
	微計算機系統與實驗 Microcomputer Systems and Lab	3	電機系 ECE	必選修 Required elective courses
	自動控制系統 Automatic Control Systems	3	電機系 ECE	必選修 Required elective courses
	控制系統設計 Design and Simulation of Control Systems	3	電機系 ECE	選修 elective courses
	數位訊號處理導論 Introduction to Digital Signal Processing	3	電機系 ECE	選修 elective courses
	動態系統模擬與實現 Analysis and Simulation of Dynamic Systems	3	電機系 ECE	選修 elective courses
	智慧型控制 Intelligent Control	3	研究所課程 Graduate Curriculum	選修 elective courses
	線性系統理論 Linear System Theory	3	研究所課程 Graduate Curriculum	選修 elective courses
	隨機過程 Stochastic Processes	3	研究所課程 Graduate Curriculum	選修 elective courses
	數位訊號處理 Digital Signal Processing	3	研究所課程 Graduate Curriculum	選修 elective courses
	數位控制系統 Digital Control System	3	研究所課程 Graduate Curriculum	選修 elective courses
	嵌入式作業系統 Embedded Operating Systems	3	研究所課程 Graduate Curriculum	選修 elective courses
	控制實驗 Control Lab	3	電機系 ECE	實驗課 Labs
多媒體訊號處理	機率 Probability	3	電機系 ECE	必選修 Required elective courses

Multimedia Signal Processing and Communication	數位訊號處理導論 Introduction to Digital Signal Processing	3	電機系 ECE	必選修 Required elective courses
	語音處理導論 Introduction to Speech Processing	3	電機系 ECE	選修 elective courses
	互動式音訊處理導論 Introduction to Interactive Audio Processing	3	電機系 ECE	選修 elective courses
	語音處理 Digital Speech Processing	3	研究所課程 Graduate Curriculum	選修 elective courses
	聽語資訊處理 Auditory and Acoustic Information Process	3	研究所課程 Graduate Curriculum	選修 elective courses
	適應性訊號處理 Adaptive Signal Processing	3	研究所課程 Graduate Curriculum	選修 elective courses
	資料壓縮 Data Compression	3	研究所課程 Graduate Curriculum	選修 elective courses
	數位訊號處理 Digital Signal Processing	3	研究所課程 Graduate Curriculum	選修 elective courses
	機器學習 Machine Learning	3	研究所課程 Graduate Curriculum	選修 elective courses
	雲端運算與巨量資料分析 Cloud Computing and Big Date Analytics	3	研究所課程 Graduate Curriculum	選修 elective courses
	數位訊號處理晶片實驗 Digital Signal Processing Chips Labs	3	電機系 ECE	實驗課 Labs
晶片設計 System-on-chip	程式化邏輯系統設計 Programmable Logic System Design	3	電機系 ECE	必選修 Required elective courses
	超大型積體電路導論 #1 Introduction to VLSI Circuits	3	電機系 ECE	選修 elective courses
	類比積體電路導論 Introduction to Analog Integrated Circuits	3	電機系 ECE	選修 elective courses
	數位訊號處理導論 Introduction to Digital Signal Processing	3	電機系 ECE	選修 elective courses
	微機電系統技術導論 Introduction to Micro Electro Mechanical Systems	3	電機系 ECE	選修 elective courses
	類比積體電路設計	3	研究所課程	必選修

		Integrated Circuit Design		Graduate Curriculum	Required elective courses
		超大型積體電路系統設計 VLSI System Design and Application	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
		數位訊號處理 Digital Signal Processing	3	研究所課程 Graduate Curriculum	選修 elective courses
		VLSI 實驗 #2 VLSI lab	3	電機系 ECE	實驗課 Labs
	通訊科學與系統 Communication Sciences and Systems	機率 Probability	3	電機系 ECE	必選修 Required elective courses
		通訊系統導論 Introduction to Communication Systems	3	電機系 ECE	必選修 Required elective courses
		數位通訊導論 Introduction to Digital Communications	3	電機系 ECE	必選修 Required elective courses
		通訊系統電腦模擬 Computer Simulation of Communication Systems	3	電機系 ECE	選修 elective courses
		數據通訊 Data Communication	3	電機系 ECE	選修 elective courses
		隨機過程 Random Process	3	研究所課程 Graduate Curriculum	選修 elective courses
		數位通訊 Digital Communication	3	研究所課程 Graduate Curriculum	選修 elective courses
		檢測與估計 Detection and Estimation	3	研究所課程 Graduate Curriculum	選修 elective courses
		展頻通訊 Spread Spectrum Communications	3	研究所課程 Graduate Curriculum	選修 elective courses
		無線通訊 Wireless Communication	3	研究所課程 Graduate Curriculum	選修 elective courses
		消息理論 Information Theory	3	研究所課程 Graduate Curriculum	選修 elective courses
		編碼理論 Coding Theory	3	研究所課程 Graduate Curriculum	選修 elective courses
		通訊系統實驗 Communication System Lab	3	電機系 ECE	實驗課 Labs

	數位訊號處理晶片實驗 Digital Signal Processing Chips Lab	3	電機系 ECE	實驗課 Labs
機器人仿生科技 Robots and Bioelectronics	JAVA 程式設計 JAVA Programming	3	電機系 ECE	選修 elective courses
	資料結構 Data Structure	3	電機系 ECE	選修 elective courses
	自動控制系統 Automatic Control Systems	3	電機系 ECE	選修 elective courses
	機率 Probability	3	電機系 ECE	必選修 Required elective courses
	機器人科技與應用 Robotics Technology and Application	2	電機系 ECE	必選修 Required elective courses
	類神經網路導論 Artificial Neural Networks	3	電機系 ECE	必選修 Required elective courses
	嵌入式作業系統 Embedded Operating Systems	3	電機系 ECE	必選修 Required elective courses
	自走式機器人 Mobile Robots	3	電機系 ECE	必選修 Required elective courses
	進階物件導向程式設計 Advanced Object-Oriented Programming	3	電機系 ECE	必選修 Required elective courses
	數位訊號處理 Digital Signal Processing	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
	模糊系統 Fuzzy Systems	3	研究所課程 Graduate Curriculum	選修 elective courses
	線性系統理論 Linear System Theory	3	研究所課程 Graduate Curriculum	選修 elective courses
	智慧型資料分析 Intelligent Data Analysis	3	研究所課程 Graduate Curriculum	選修 elective courses
	機器人學 Robotics	3	研究所課程 Graduate Curriculum	選修 elective courses
	智慧機器人實驗 Intelligent Robotics Laboratory	3	電機系 ECE	實驗課 Labs
	數位訊號處理晶片實驗 Digital Signal Processing Chips Labs	3	電機系 ECE	實驗課 Labs



電力電子 Power Electronics	電力電子導論 Introduction to Power Electronics	3	電機系 ECE	必選修 Required elective courses
	電力工程導論 Introduction to Electrical Power Engineering	3	電機系 ECE	必選修 Required elective courses
	自動控制系統 Automatic Control Systems	3	電機系 ECE	選修 elective courses
	類比積體電路導論 Introduction to Analog Integrated Circuits	3	電機系 ECE	選修 elective courses
	電力電子 Power Electronics	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
	電動機控制 Motor Control	3	研究所課程 Graduate Curriculum	選修 elective courses
	數位電源控制 Digital Power Control	3	研究所課程 Graduate Curriculum	選修 elective courses
	功率積體電路設計 Power Integrated Circuit Design	3	研究所課程 Graduate Curriculum	選修 elective courses
	類比積體電路設計 Design and Applications of Analog Integrated Circuits	3	研究所課程 Graduate Curriculum	選修 elective courses
	交換式電源供應器設計 Switching Power Supply Design	3	研究所課程 Graduate Curriculum	選修 elective courses
	電力電子實驗 Power Electronics Labs	3	電機系 ECE	實驗課 Labs
無線科技 Wireless and Microwave Techniques	微波工程導論 Foundations for Microwave Engineering	3	電機系 ECE	必選修 Required elective courses
	天線導論 Introduction to Antennas	3	電機系 ECE	必選修 Required elective courses
	數值分析 Numerical Analysis	3	電機系 ECE	選修 elective courses
	光電工程導論 Introduction to Opto-electronic Engineering	3	電機系 ECE	選修 elective courses
	無線通訊之電波傳播與天線 Radio Propagation and Antennas for Wireless Communications	3	電機系 ECE	選修 elective courses
	通訊電子學 Communication Electronics	3	電機系 ECE	選修 elective courses

	固態電子學 Solid State Electronics	3	電機系 ECE	選修 elective courses
	微波工程(一) Microwave Engineering(1)	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
	天線理論 Antenna Theory	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
	類比積體電路設計 Integrated Circuit Design	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
	物理數學 Mathematical Methods of Physics	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
	高等電磁學 Advanced Electromagnetics	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
	微波工程(二) Microwave Engineering(2)	3	研究所課程 Graduate Curriculum	選修 elective courses
	微波量測原理 Theory of Microwave Measurement	3	研究所課程 Graduate Curriculum	選修 elective courses
	微波電路設計與製造 Laboratory Microwave Circuit Design Laboratory	3	研究所課程 Graduate Curriculum	選修 elective courses
	電磁相容 Electromagnetic Compatibility in Integrated Circuits	3	研究所課程 Graduate Curriculum	選修 elective courses
	微波主動元件 Active Microwave Circuit	3	研究所課程 Graduate Curriculum	選修 elective courses
	射頻積體電路設計 Radio Frequency Integrated Circuits Design	3	研究所課程 Graduate Curriculum	選修 elective courses
	射頻積體電路實驗 Radio Frequency Integrated Circuits Lab	3	研究所課程 Graduate Curriculum	選修 elective courses
	手機行動通訊系統 Mobile Phone Communication System	3	研究所課程 Graduate Curriculum	選修 elective courses
	射頻電路原理與實驗 Principle and Lab of RF Circuit	3	電機系 ECE	實驗課 Labs
資訊通訊 Information and Communications	JAVA 程式設計 JAVA Programming	3	電機系 ECE	必選修 Required elective courses
	資料結構	3	電機系	選修

	Data Structure		ECE	elective courses
	物件導向程式設計 Object-Oriented Programming	3	電機系 ECE	選修 elective courses
	機率 Probability	3	電機系 ECE	必選修 Required elective courses
	數據通訊 Data Communication	3	電機系 ECE	選修 elective courses
	網路安全導論 Introduction to Network Security	3	電機系 ECE	選修 elective courses
	嵌入式系統導論 Introduction to Embedded Systems	3	電機系 ECE	選修 elective courses
	電腦網路導論 Introduction to Computer Networks	3	電機系 ECE	選修 elective courses
	作業系統 Operating Systems	3	電機系 ECE	選修 elective courses
	無線網路導論 Introduction to Wireless Networks	3	電機系 ECE	選修 elective courses
	排隊理論 Queuing Theory	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
	計算機網路 Computer Networks	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
	無線網路 Wireless Network	3	研究所課程 Graduate Curriculum	選修 elective courses
	行動計算 Mobile Computing	3	研究所課程 Graduate Curriculum	選修 elective courses
	無線隨意網路 Wireless Ad Hoc Networks	3	研究所課程 Graduate Curriculum	選修 elective courses
	網路安全 Network Security	3	研究所課程 Graduate Curriculum	選修 elective courses
	嵌入式系統設計 Embedded Systems Design	3	研究所課程 Graduate Curriculum	選修 elective courses
	演算法 Algorithms	3	研究所課程 Graduate Curriculum	選修 elective courses
	通訊網路實驗 Communication Networks	3	電機系 ECE	實驗課 Labs

	Lab				
	軟體創意專題 Creative Software Project	3	電機系 ECE	實驗課 Labs	
生醫工程 Biomedical Electronics and Information	醫學工程 Biomedical Engineering Research	3	電機系 ECE	必選修 Required elective courses	
	數位訊號處理導論 Introduction to Digital Signal Processing	3	電機系 ECE	選修 elective courses	
	創新工程 Innovation Engineering	3	電機系 ECE	選修 elective courses	
	生醫電學 Bioelectricity	3	研究所課程 Graduate Curriculum	選修 elective courses	
	神經彌補裝置 Neural Prosthesis	3	研究所課程 Graduate Curriculum	選修 elective courses	
	認知神經工程 Cognitive Neuro Engineering	3	研究所課程 Graduate Curriculum	選修 elective courses	
	數位訊號處理 Digital Signal Processing	3	研究所課程 Graduate Curriculum	選修 elective courses	
	影像處理 Digital Image Processing	3	研究所課程 Graduate Curriculum	選修 elective courses	
	神經心臟電生理 Neural and Cardiac Electrophysiology	3	研究所課程 Graduate Curriculum	選修 elective courses	
	生醫信號分析與模擬 Biomedical Signal Analysis and Modeling	3	研究所課程 Graduate Curriculum	選修 elective courses	
	創新工程 Innovation Engineering	3	研究所課程 Graduate Curriculum	選修 elective courses	
	超音波導論與應用 Introduction to Ultrasound and its Applications	3	研究所課程 Graduate Curriculum	選修 elective courses	
	生醫工程實驗 Biomedical Engineering Laboratory	3	電機系 ECE	實驗課 Labs	
	計算機工程 Computer Engineering	資料結構 Data Structure	3	電機系 ECE	必選修 Required elective courses
		物件導向程式設計 Object-Oriented Programming	3	電機系 ECE	選修 elective courses
離散數學 Discrete Mathematics		3	電機系 ECE	選修 elective courses	

	計算機組織 Computer Organization	3	電機系 ECE	必選修 Required elective courses
	作業系統 Operating Systems	3	電機系 ECE	必選修 Required elective courses
	嵌入式系統導論 Introduction to Embedded Systems	3	電機系 ECE	選修 elective courses
	電腦網路導論 Introduction to Computer Networks	3	電機系 ECE	選修 elective courses
	計算機結構 Computer Architecture	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
	演算法 Algorithms	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
	計算機網路 Computer Network	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
	排隊理論 Queuing Theory	3	研究所課程 Graduate Curriculum	選修 elective courses
	嵌入式系統設計 Embedded System Design	3	研究所課程 Graduate Curriculum	選修 elective courses
	雲端運算與巨量資料分析 Cloud Computing and Big Date Analytics	3	研究所課程 Graduate Curriculum	選修 elective courses
	平行程式 Parallel Programming	3	研究所課程 Graduate Curriculum	選修 elective courses
	網路安全 Network Security	3	研究所課程 Graduate Curriculum	選修 elective courses
	智慧型手機應用程式設計 Smart Phone Programming	3	研究所課程 Graduate Curriculum	選修 elective courses
	機器學習 Machine Learning	3	研究所課程 Graduate Curriculum	選修 elective courses
	硬體創意專題 Creative Hardware Project	3	電機系 ECE	實驗課 Labs
	軟體創意專題 Creative Software Project	3	電機系 ECE	實驗課 Labs
他系跨域模組 (依他系學分數規定)	本校各系所或學院所提供之 跨域模組學程，擇一修畢	28		

Cross-disciplinary modules at other department ( 28-32 credits)	The cross-disciplinary modules offer by departments or colleges at our university; choose one to complete.		
共同必修 Common Required Courses	28	校必修：含共同必修 28 學分（含外語課程必修 8 學分），至多採計 40 學分 [註 1] Required courses of the university (including 28 credits of general education subjects, 8 credits of foreign language course inclusive with the maximum 40 credits countable)	
最低畢業學分 Minimum Credits Required for Graduation	128		

註：本校共同必修科目表規定，外語課程必修至少 6 學分。如大學部學生修習共同必修學分數超過 28 學分以上，本校至多可採至 40 學分於最低畢業學分內，但各學系另有規定者，從其規定。

電機工程學系「跨域模組課程」必修科目表(B)

The Required Courses List for the students study Cross-disciplinary module curriculum in ECE Department

類別 Category	選別 Classification	科目名稱 Courses	學分 Credits	開課系所 Dept.	備註 Remarks
本系跨域模組 (32 學分)  Cross-disciplinary courses at our department (32 credits)	必修(17 學分) Compulsory Courses (17 credits)	邏輯設計與實驗 Logic Design and Lab	3	電機系 ECE	
		跨領域專題(一) Projects of Cross-disciplinary(I)	0	電機系 ECE	
		跨領域專題(二) Projects of Cross-disciplinary(II)	0	電機系 ECE	必選修 Required elective courses
		電子學(一) Electronics (I)	3	電機系 ECE	
		電子實驗(一) Electronics Lab (I)	2	電機系 ECE	
		訊號與系統 Signals and Systems	3	電機系 ECE	
		微分方程 Differential Equation	3	電機系 ECE	
		微算機原理與實驗 Principle of Microcomputer	3	電機系 ECE	
專業選修領域 Elective Courses in Professional Programs	應從 10 個領域自行選擇一個主修領域及該領域至少 1 門必選修、3 門選修及 1 門實驗課，修滿至少 15 學分。 You are required to choose 1 programs from 10 different programs, and take at least 1 Required elective courses, 3 elective courses, and 1 Lab from that program. At least 15 credits.				
	系統控制 System Control	複變函數 Complex Variables	3	電機系 ECE	必選修 Required elective courses
		機率 Probability	3	電機系 ECE	必選修 Required elective courses
		微算機系統與實驗 Microcomputer Systems and Lab	3	電機系 ECE	必選修 Required elective courses
		自動控制系統 Automatic Control Systems	3	電機系 ECE	必選修 Required elective courses
		控制系統設計 Design and Simulation of Control Systems	3	電機系 ECE	選修 elective courses

	數位訊號處理導論 Introduction to Digital Signal Processing	3	電機系 ECE	選修 elective courses
	動態系統模擬與實現 Analysis and Simulation of Dynamic Systems	3	電機系 ECE	選修 elective courses
	智慧型控制 Intelligent Control	3	研究所課程 Graduate Curriculum	選修 elective courses
	線性系統理論 Linear System Theory	3	研究所課程 Graduate Curriculum	選修 elective courses
	隨機過程 Stochastic Processes	3	研究所課程 Graduate Curriculum	選修 elective courses
	數位訊號處理 Digital Signal Processing	3	研究所課程 Graduate Curriculum	選修 elective courses
	數位控制系統 Digital Control System	3	研究所課程 Graduate Curriculum	選修 elective courses
	嵌入式作業系統 Embedded Operating Systems	3	研究所課程 Graduate Curriculum	選修 elective courses
	控制實驗 Control Lab	3	電機系 ECE	實驗課 Labs
多媒體訊號處理 Multimedia Signal Processing and Communication	機率 Probability	3	電機系 ECE	必選修 Required elective courses
	數位訊號處理導論 Introduction to Digital Signal Processing	3	電機系 ECE	必選修 Required elective courses
	語音處理導論 Introduction to Speech Processing	3	電機系 ECE	選修 elective courses
	互動式音訊處理導論 Introduction to Interactive Audio Processing	3	電機系 ECE	選修 elective courses
	語音處理 Digital Speech Processing	3	研究所課程 Graduate Curriculum	選修 elective courses
	聽語資訊處理 Auditory and Acoustic Information Process	3	研究所課程 Graduate Curriculum	選修 elective courses
	適應性訊號處理 Adaptive Signal Processing	3	研究所課程 Graduate Curriculum	選修 elective courses
	資料壓縮	3	研究所課程	選修



		Data Compression		Graduate Curriculum	elective courses
		數位訊號處理 Digital Signal Processing	3	研究所課程 Graduate Curriculum	選修 elective courses
		機器學習 Machine Learning	3	研究所課程 Graduate Curriculum	選修 elective courses
		雲端運算與巨量資料分析 Cloud Computing and Big Data Analytics	3	研究所課程 Graduate Curriculum	選修 elective courses
		數位訊號處理晶片實驗 Digital Signal Processing Chips Labs	3	電機系 ECE	實驗課 Labs
	晶片設計 System-on-chip	程式化邏輯系統設計 Programmable Logic System Design	3	電機系 ECE	必選修 Required elective courses
		超大型積體電路導論 #1 Introduction to VLSI Circuits	3	電機系 ECE	選修 elective courses
		類比積體電路導論 Introduction to Analog Integrated Circuits	3	電機系 ECE	選修 elective courses
		數位訊號處理導論 Introduction to Digital Signal Processing	3	電機系 ECE	選修 elective courses
		微機電系統技術導論 Introduction to Micro Electro Mechanical Systems	3	電機系 ECE	選修 elective courses
		類比積體電路設計 Integrated Circuit Design	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
		超大型積體電路系統設計 VLSI System Design and Application	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
		數位訊號處理 Digital Signal Processing	3	研究所課程 Graduate Curriculum	選修 elective courses
		VLSI 實驗 #2 VLSI lab	3	電機系 ECE	實驗課 Labs
	通訊科學與系統 Communication Sciences and Systems	機率 Probability	3	電機系 ECE	必選修 Required elective courses
		通訊系統導論 Introduction to Communication Systems	3	電機系 ECE	必選修 Required elective courses
		數位通訊導論	3	電機系 ECE	必選修

		Introduction to Digital Communications			Required elective courses
		通訊系統電腦模擬 Computer Simulation of Communication Systems	3	電機系 ECE	選修 elective courses
		數據通訊 Data Communication	3	電機系 ECE	選修 elective courses
		隨機過程 Random Process	3	研究所課程 Graduate Curriculum	選修 elective courses
		數位通訊 Digital Communication	3	研究所課程 Graduate Curriculum	選修 elective courses
		檢測與估計 Detection and Estimation	3	研究所課程 Graduate Curriculum	選修 elective courses
		展頻通訊 Spread Spectrum Communications	3	研究所課程 Graduate Curriculum	選修 elective courses
		無線通訊 Wireless Communication	3	研究所課程 Graduate Curriculum	選修 elective courses
		消息理論 Information Theory	3	研究所課程 Graduate Curriculum	選修 elective courses
		編碼理論 Coding Theory	3	研究所課程 Graduate Curriculum	選修 elective courses
		通訊系統實驗 Communication System Lab	3	電機系 ECE	實驗課 Labs
		數位訊號處理晶片實驗 Digital Signal Processing Chips Lab	3	電機系 ECE	實驗課 Labs
	機器人仿生科技 Robots and Bioelectronics	JAVA 程式設計 JAVA Programming	3	電機系 ECE	選修 elective courses
		資料結構 Data Structure	3	電機系 ECE	選修 elective courses
		自動控制系統 Automatic Control Systems	3	電機系 ECE	選修 elective courses
		機率 Probability	3	電機系 ECE	必選修 Required elective courses
		機器人科技與應用 Robotics Technology and Application	2	電機系 ECE	必選修 Required elective courses
		類神經網路導論 Artificial Neural Networks	3	電機系 ECE	必選修 Required

					elective courses
		嵌入式作業系統 Embedded Operating Systems	3	電機系 ECE	必選修 Required elective courses
		自走式機器人 Mobile Robots	3	電機系 ECE	必選修 Required elective courses
		進階物件導向程式設計 Advanced Object-Oriented Programming	3	電機系 ECE	必選修 Required elective courses
		數位訊號處理 Digital Signal Processing	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
		模糊系統 Fuzzy Systems	3	研究所課程 Graduate Curriculum	選修 elective courses
		線性系統理論 Linear System Theory	3	研究所課程 Graduate Curriculum	選修 elective courses
		智慧型資料分析 Intelligent Data Analysis	3	研究所課程 Graduate Curriculum	選修 elective courses
		機器人學 Robotics	3	研究所課程 Graduate Curriculum	選修 elective courses
		智慧機器人實驗 Intelligent Robotics Laboratory	3	電機系 ECE	實驗課 Labs
		數位訊號處理晶片實驗 Digital Signal Processing Chips Labs	3	電機系 ECE	實驗課 Labs
	電力電子 Power Electronics	電力電子導論 Introduction to Power Electronics	3	電機系 ECE	必選修 Required elective courses
		電力工程導論 Introduction to Electrical Power Engineering	3	電機系 ECE	必選修 Required elective courses
		自動控制系統 Automatic Control Systems	3	電機系 ECE	選修 elective courses
		類比積體電路導論 Introduction to Analog Integrated Circuits	3	電機系 ECE	選修 elective courses
		電力電子 Power Electronics	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
		電動機控制 Motor Control	3	研究所課程 Graduate Curriculum	選修 elective courses

	數位電源控制 Digital Power Control	3	研究所課程 Graduate Curriculum	選修 elective courses
	功率積體電路設計 Power Integrated Circuit Design	3	研究所課程 Graduate Curriculum	選修 elective courses
	類比積體電路設計 Design and Applications of Analog Integrated Circuits	3	研究所課程 Graduate Curriculum	選修 elective courses
	交換式電源供應器設計 Switching Power Supply Design	3	研究所課程 Graduate Curriculum	選修 elective courses
	電力電子實驗 Power Electronics Labs	3	電機系 ECE	實驗課 Labs
無線科技 Wireless and Microwave Techniques	微波工程導論 Foundations for Microwave Engineering	3	電機系 ECE	必選修 Required elective courses
	天線導論 Introduction to Antennas	3	電機系 ECE	必選修 Required elective courses
	數值分析 Numerical Analysis	3	電機系 ECE	選修 elective courses
	光電工程導論 Introduction to Opto-electronic Engineering	3	電機系 ECE	選修 elective courses
	無線通訊之電波傳播與天線 Radio Propagation and Antennas for Wireless Communications	3	電機系 ECE	選修 elective courses
	通訊電子學 Communication Electronics	3	電機系 ECE	選修 elective courses
	固態電子學 Solid State Electronics	3	電機系 ECE	選修 elective courses
	微波工程(一) Microwave Engineering(1)	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
	天線理論 Antenna Theory	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
	類比積體電路設計 Integrated Circuit Design	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
	物理數學 Mathematical Methods of Physics	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
	高等電磁學 Advanced Electromagnetics	3	研究所課程 Graduate Curriculum	必選修 Required elective courses

	微波工程(二) Microwave Engineering(2)	3	研究所課程 Graduate Curriculum	選修 elective courses
	微波量測原理 Theory of Microwave Measurement	3	研究所課程 Graduate Curriculum	選修 elective courses
	微波電路設計與製造 Microwave Circuit Design Laboratory	3	研究所課程 Graduate Curriculum	選修 elective courses
	電磁相容 Electromagnetic Compatibility in Integrated Circuits	3	研究所課程 Graduate Curriculum	選修 elective courses
	微波主動元件 Active Microwave Circuit	3	研究所課程 Graduate Curriculum	選修 elective courses
	射頻積體電路設計 Radio Frequency Integrated Circuits Design	3	研究所課程 Graduate Curriculum	選修 elective courses
	射頻積體電路實驗 Radio Frequency Integrated Circuits Lab	3	研究所課程 Graduate Curriculum	選修 elective courses
	手機行動通訊系統 Mobile Phone Communication System	3	研究所課程 Graduate Curriculum	選修 elective courses
	射頻電路原理與實驗 Principle and Lab of RF Circuit	3	電機系 ECE	實驗課 Labs
資訊通訊 Information and Communications	JAVA 程式設計 JAVA Programming	3	電機系 ECE	必選修 Required elective courses
	資料結構 Data Structure	3	電機系 ECE	選修 elective courses
	物件導向程式設計 Object-Oriented Programming	3	電機系 ECE	選修 elective courses
	機率 Probability	3	電機系 ECE	必選修 Required elective courses
	數據通訊 Data Communication	3	電機系 ECE	選修 elective courses
	網路安全導論 Introduction to Network Security	3	電機系 ECE	選修 elective courses
	嵌入式系統導論 Introduction to Embedded Systems	3	電機系 ECE	選修 elective courses
	電腦網路導論 Introduction to Computer	3	電機系 ECE	選修 elective courses

	Networks			
	作業系統 Operating Systems	3	電機系 ECE	選修 elective courses
	無線網路導論 Introduction to Wireless Networks	3	電機系 ECE	選修 elective courses
	排隊理論 Queuing Theory	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
	計算機網路 Computer Networks	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
	無線網路 Wireless Network	3	研究所課程 Graduate Curriculum	選修 elective courses
	行動計算 Mobile Computing	3	研究所課程 Graduate Curriculum	選修 elective courses
	無線隨意網路 Wireless Ad Hoc Networks	3	研究所課程 Graduate Curriculum	選修 elective courses
	網路安全 Network Security	3	研究所課程 Graduate Curriculum	選修 elective courses
	嵌入式系統設計 Embedded Systems Design	3	研究所課程 Graduate Curriculum	選修 elective courses
	演算法 Algorithms	3	研究所課程 Graduate Curriculum	選修 elective courses
	通訊網路實驗 Communication Networks Lab	3	電機系 ECE	實驗課 Labs
	軟體創意專題 Creative Software Project	3	電機系 ECE	實驗課 Labs
生醫工程 Biomedical Electronics and Information	醫學工程 Biomedical Engineering Research	3	電機系 ECE	必選修 Required elective courses
	數位訊號處理導論 Introduction to Digital Signal Processing	3	電機系 ECE	選修 elective courses
	創新工程 Innovation Engineering	3	電機系 ECE	選修 elective courses
	生醫電學 Bioelectricity	3	研究所課程 Graduate Curriculum	選修 elective courses
	神經彌補裝置 Neural Prosthesis	3	研究所課程 Graduate Curriculum	選修 elective courses

		認知神經工程 Cognitive Neuro Engineering	3	研究所課程 Graduate Curriculum	選修 elective courses
		數位訊號處理 Digital Signal Processing	3	研究所課程 Graduate Curriculum	選修 elective courses
		影像處理 Digital Image Processing	3	研究所課程 Graduate Curriculum	選修 elective courses
		神經心臟電生理 Neural and Cardiac Electrophysiology	3	研究所課程 Graduate Curriculum	選修 elective courses
		生醫信號分析與模擬 Biomedical Signal Analysis and Modeling	3	研究所課程 Graduate Curriculum	選修 elective courses
		創新工程 Innovation Engineering	3	研究所課程 Graduate Curriculum	選修 elective courses
		超音波導論與應用 Introduction to Ultrasound and its Applications	3	研究所課程 Graduate Curriculum	選修 elective courses
		生醫工程實驗 Biomedical Engineering Laboratory	3	電機系 ECE	實驗課 Labs
	計算機工程 Computer Engineering	資料結構 Data Structure	3	電機系 ECE	必選修 Required elective courses
		物件導向程式設計 Object-Oriented Programming	3	電機系 ECE	選修 elective courses
		離散數學 Discrete Mathematics	3	電機系 ECE	選修 elective courses
		計算機組織 Computer Organization	3	電機系 ECE	必選修 Required elective courses
		作業系統 Operating Systems	3	電機系 ECE	必選修 Required elective courses
		嵌入式系統導論 Introduction to Embedded Systems	3	電機系 ECE	選修 elective courses
		電腦網路導論 Introduction to Computer Networks	3	電機系 ECE	選修 elective courses
		計算機結構 Computer Architecture	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
		演算法 Algorithms	3	研究所課程 Graduate	必選修 Required

			Curriculum	elective courses
	計算機網路 Computer Network	3	研究所課程 Graduate Curriculum	必選修 Required elective courses
	排隊理論 Queuing Theory	3	研究所課程 Graduate Curriculum	選修 elective courses
	嵌入式系統設計 Embedded System Design	3	研究所課程 Graduate Curriculum	選修 elective courses
	雲端運算與巨量資料分析 Cloud Computing and Big Data Analytics	3	研究所課程 Graduate Curriculum	選修 elective courses
	平行程式 Parallel Programming	3	研究所課程 Graduate Curriculum	選修 elective courses
	網路安全 Network Security	3	研究所課程 Graduate Curriculum	選修 elective courses
	智慧型手機應用程式設計 Smart Phone Programming	3	研究所課程 Graduate Curriculum	選修 elective courses
	機器學習 Machine Learning	3	研究所課程 Graduate Curriculum	選修 elective courses
	硬體創意專題 Creative Hardware Project	3	電機系 ECE	實驗課 Labs
	軟體創意專題 Creative Software Project	3	電機系 ECE	實驗課 Labs
	總學分 Total Credits	32		