

電機資訊國際碩士學位學程

112 學年度(112.12 修訂)

最低修業年限	一至四年為原則
應修學分數	<p>1. 專業科目 24 學分，在學期間，專題研討至少須通過三學期，個別研究至少須通過兩學期。一年畢業者，專題研討須通過二學期。</p> <p>2. 2 門合計至少 4 學分華語語文課程（不計入畢業學分）。</p>
應修（應選）課程及符合畢業資格之修課相關規定	<p>1.專業科目包括下列第一類至第四類之課程及其最少學分數：</p> <p>第一類 --- 主修學程專業課程六學分</p> <p>奈米元件與電路(Nanoelectronic devices and circuit)專業課程： 十七選二，數位積體電路、積體電路設計實驗、射頻超大型積體電路設計、類比積體電路設計、嵌入式系統設計、記憶體系統、計算機架構/計算機結構、數位訊/信號處理、半導體記憶體、超大型積體電路系統設計、記憶體積體電路、半導體物理及元件(一)、數值半導體元件模式、測試與可測試性設計、元件設計與模擬實驗、微機電元件技術、資料轉換積體電路。</p> <p>通訊技術(Communication Technology)專業課程： 十九選二，無線通訊系統設計/無線通訊系統設計與實作、計算機網路、網路安全、光纖通訊、消息理論、網通服務導向架構、計算機架構/計算機結構、數位訊/信號處理、物聯網技術與應用*、無線通訊、檢測與估計、排隊理論、智慧霧運算系統和設計、無線行動網路的協議和系統設計、模式化通訊 IC 設計、人工智慧無線通訊、元件設計與模擬實驗、最佳化理論與應用、行動網路安全。</p> <p>光電與顯示技術 (Photonics and Display)專業課程： 十四選二，幾何光學、光纖通訊、平面顯示器概論、顯示電子電路、光學系統導論、影像處理/數位影像處理、計算機架構/計算機結構、臨床光學影像技術、光電子學(一)、光電子學(二)、半導體物理及元件(一)、數值半導體元件模式、材料光學、量子光學導論。</p> <p>生醫與控制系統(Biomedical and Control Systems) 專業課程： 十四選二，數位訊/信號處理、影像處理/數位影像處理、計算機架構/計算機結構、嵌入式系統設計、生醫電子與系統、神經彌補裝置、適應性訊號處理、近代生醫電學、臨床光學影像技術、智慧型控制、檢測與估計、自走式機器人、生醫感測暨腫瘤醫學特論、神經微控技術。</p> <p>電腦科學與人工智慧(Computer Science and Artificial Intelligence) 專業課程： 十八選二，排隊理論、計算機架構/計算機結構、嵌入式系統設計、機器學習、影像處理/數位影像處理、人工智慧、3D 遊戲程式、計算機網路、網路安全、物聯網技術與應用*、智慧霧運算系統和設計、無線行動網路的協議和系統設計、人工智慧無線通訊、深度學習、資料探勘、機器學習之訊號處理應用、VLSI 數位訊號處理架構設計、電腦視覺。</p> <p>第二類 --- 共同專業選修課程九學分。共同專業課程包含第一類課程，及電機學院與資訊學院所開授之專業課程。</p> <p>第三類 --- 自由選修課程九學分。自由選修課程包含第二類課程，及台灣聯合大學系統各院系所開授之其他專業課程。 如擬選修外校或外院所開的課程，應填具「外校或外院課程認定申請表」，並由指導教授簽名及本學程主任核定，始得承認並列入畢業學分。所填具申請表應於當學期開學加退選截止日期前向本學程提出申請。</p> <p>第四類 --- 專題研討。在學期間至少須通過三學期；一年畢業者，須通過二學期。除資訊院碩班學生，其餘轉所學生於原所所修之專題研討不可抵免本學程的專題研討。</p>

	<p>2. 畢業前須修滿二門合計至少四學分華語語文課程（不計入畢業學分）。學生通過華語語文能力測驗者得免修華語語文課程。</p> <p>3. 每學期須選修「個別研究」課程，由碩士論文指導教授評分，以評定學生之研究水準，但其學分數不計入前述規定之畢業學分內。畢業前該課程至少須有二學期成績為通過。提前畢業者不在此限。</p> <p>4. 應於入學第一學期結束前，至「台灣學術倫理教育資源中心」平台修習「學術倫理教育」課程，並通過課程總測驗成績達及格標準。未通過總測驗之學生，不得申請學位考試。</p> <p>5. 完成碩士論文並通過畢業口試。</p>
備註	*該增訂課程亦適用於所有在學生

EECS International Graduate Program Master Degree Curriculum Academic Year 2023

Minimum Term of Study	One to Four Years
Minimum Credits	<p>1. 24 credits of graduate-level courses.</p> <p>2. Students should at least pass the graduate seminar course for 3 semesters, and two semesters for independent study. For students who graduate in one year, they should take and pass seminar courses in both semesters.</p> <p>3. Two courses or at least four credits of Chinese language courses (not counted toward fulfillment of the program)</p>
Curriculum and Regulations	<p>1. Every master degree student enrolled in EECS International Graduate Program must complete at least twenty-four (24) credit hours of graduate-level courses before graduation. The curriculum should consist of the following four categories:</p> <p>(A) Major Technical Courses [6 credits] The major technical courses are determined by the Curriculum Committee of academic institutes in the ECE and CS Colleges. These courses are listed in the “List of Major Technical Courses” as appendix.</p> <p>(B) Common Technical Courses [9 credits] The common technical courses include all the major technical courses and other graduate-level technical courses offered by NCTU ECE & CS Colleges.</p> <p>(C) Elective Courses [9 credits] The elective courses include all the common technical courses and all graduate level courses offered by the University System of Taiwan (UST). Accreditation of courses taken outside of Electrical Engineering and Computer Science areas must be approved by a student’s advisor or the director of EECS International Graduate Program , and should apply them before the add and drop deadline.</p> <p>(D) Graduate Seminar Course [Mandatory, 0 credit] Every student must enroll in the graduate seminar course for at least three semesters before graduation. For those students who graduate in one year, they should take the seminar course in both semesters. Students who transferred from colleges other than CS college that took seminar courses from their original colleges cannot waive seminar course requirements of this program.</p> <p>2. Every student must take 2 courses or at least 4 credits of Chinese language courses (which cannot be counted toward fulfillment of EECS International Graduate Program) before and during their study at NCTU. Students who pass Test of Chinese as a Foreign Language (TOCFL) or other Chinese language proficiency test can waive the Chinese language course requirements.</p> <p>3. Every student should take an independent study course in every semester throughout their study at NCTU. Their performance in the independent study is evaluated by their thesis advisor. Every student must complete at least two independent study courses with passing grades before graduation. The independent study courses are not counted toward fulfillment of course requirements.</p> <p>4. Students should study the “Research Ethics Course” on the “Taiwan Academic Ethics</p>

	Education Resource Center” platform before the end of the first semester after enrollment. Students who fail to pass the final test cannot apply for degree exam. 5. A student who fails to complete the course requirements and/or pass the master degree examination within his/her term of study will be dismissed from the program. His/her enrollment at NCTU will be also terminated.
Notes	The appendix, list of Major Technical Courses, is applicable to all current students.

Appendix: List of Major Technical Course (2023 Spring)

Major Technical Courses for 5 Concentrations of EECS IGP	
Concentration I : Nanoelectronic devices and circuit , (2 out of 16 courses)	
Digital IC 數位積體電路	
IC Lab Design 積體電路設計實驗	
RF VLSI 射頻超大型積體電路設計	
Analog IC Design 類比積體電路設計	
Embedded System Design 嵌入式系統設計	
Memory Systems 記憶體系統	
Computer Architecture 計算機架構/計算機結構	
Digital Signal Processing 數位訊/信號處理	
Semiconductor Memory 半導體記憶體	
VLSI System Design and Application 超大型積體電路系統設計	
Memory Circuit Design 記憶體積體電路	
Semiconductor Physics and Devices (I) 半導體物理及元件(一)	
Numerical Semiconductor Device Modeling 數值半導體元件模式	
Testing and Design for Testability 測試與可測試性設計	
Device Design and Simulation Lab. 元件設計與模擬實驗	
Component Technology of MEMS 微機電元件技術	
Concentration II : Communication Technology , (2 out of 18 courses)	
Wireless Communication System Design/ Wireless Communication Systems 無線通訊系統設計/無線通訊系統設計與實作	
Computer Networks 計算機網路	
Network Security 網路安全	
Optical Fiber Communication 光纖通訊	
Information Theory 消息理論	
Service-Oriented Architecture Technologies for Telecommunications 網通服務導向架構	
Computer Architecture 計算機結構/計算機結構	
Digital Signal Processing 數位訊/信號處理	
Key Technologies for Internet of Things/ Key Technologies for Internet of Things and their applications/ IoT/M2M Technologies and Applications 物聯網核心技術/物聯網核心技術及應用專題/物聯網技術與應用	
Wireless Communication 無線通訊	
Detection and Estimation 檢測與估計	
Queuing Theory 排隊理論	
Intelligent Fog Computing Systems and Designs 智慧霧運算系統和設計	
Protocol and Systems Design for Wireless Mobile Networks 無線行動網路的協議和系統設計	
Model-based Communication IC Design 模式化通訊 IC 設計	
Artificial Intelligence Wireless 人工智慧無線通訊	
Device Design and Simulation Lab. 元件設計與模擬實驗	
Optimization Theory and Applications 最佳化理論與應用	

Concentration III : Photonics and Display(2 out 13 courses)
Geometrical Optics 幾何光學
Optical Fiber Communications 光纖通訊
Introduction to Flat Panel Display 平面顯示器概論
Electronic Circuits for Display 顯示電子電路
Introduction to Optical Systems 光學系統導論
Image Processing /Digital Image Processing 影像處理/數位影像處理
Computer Architecture 計算機架構/計算機結構
Advanced Clinical Optical Imaging Technology 臨床光學影像技術
Optoelectronics (I)光電子學(一)
Optoelectronics (II)光電子學(二)
Semiconductor Physics and Devices (I)半導體物理及元件(一)
Numerical Semiconductor Device Modeling 數值半導體元件模式
The Optical Properties of Materials 材料光學
Concentration IV : Biomedical and Control Systems (2 out 14 courses)
Digital Signal Processing 數位訊號/信號處理
Image Processing /Digital Image Processing 影像處理/數位影像處理
Computer Architecture 計算機架構/計算機結構
Embedded System Design 嵌入式系統設計
Biomedical Circuit & Systems 生醫電子與系統
Neural Prostheses 神經彌補裝置
Adaptive Signal Processing 適應性訊號處理
Modern Bioelectricity 近代生醫電學
Advanced Clinical Optical Imaging Technology 臨床光學影像技術
Intelligent Control 智慧型控制
Detection and Estimation 檢測與估計
Mobile Robots 自走式機器人
Advanced Biomedicine Sensing and Oncology 生醫感測暨腫瘤醫學特論
Microcontrol techniques for neuroscience 神經微控技術
Concentration V : Computer Science and Artificial Intelligence(2 out 18 courses)
Queuing Theory 排隊理論
Computer Architecture 計算機架構/計算機結構
Embedded System Design 嵌入式系統設計
Machine Learning 機器學習
Image Processing /Digital Image Processing 影像處理/數位影像處理
Artificial Intelligence 人工智慧
3D Game Programming 3D 遊戲程式
Computer Networks 計算機網路
Network Security 網路安全
IoT/M2M Technologies and Applications 物聯網技術與應用
Intelligent Fog Computing Systems and Designs 智慧霧運算系統和設計
Protocol and Systems Design for Wireless Mobile Networks 無線行動網路的協議和系統設計
Artificial Intelligence Wireless 人工智慧無線通訊
Deep Learning 深度學習
Data Mining 資料探勘
Machine Learning for Signal Processing 機器學習之訊號處理應用
VLSI Digital Signal Processing VLSI 數位訊號處理架構設計
Computer Vision 電腦視覺

電機資訊國際博士學位學程

112 學年度

最低修業年限	二年
應修學分數	18
直升博士生 應修學分數	30 學分
應修（應選）課程 及符合畢業資格之 修課相關規定	<p>(1) 畢業前須修畢並完成下列課程要求：</p> <ul style="list-style-type: none"> ● 專業科目至少 18 學分，其中包含電機資訊兩院專業課程 12 學分及其他選修專業課程 6 學分。 ● 逕博生畢業前至少應修滿含碩士修業期間 30 學分（不含論文研討），其中至少 18 學分須為電機資訊兩院開設之專業科目。 ● 2 門合計至少 4 學分華語語文課程。通過華語語文能力測驗者或已獲得本校電機資訊國際碩士學位者，得免修華語課程；入學前已在本校或他校修習的華語課程，得視情形抵免本學程的華語語文課程。 ● 博一、博二每學期必選專題研討（不計入應修學分數），畢業前至少有四學期專題研討及格成績。除台聯大光電博及資訊院博班學生，其餘轉所學生於原所所修之專題研討不可抵免本學程的專題研討。 <p>(2) 博一、博二之選課均須經由指導教授或學程主任認可。</p> <p>(3) 博士生入學第一學期結束前，須繳交經指導教授簽字同意之指導教授協議書（含選定之 4 門資格考核科目）。</p> <p>(4) 選修非電機資訊兩院開設之選修專業課程，得經指導教授或學程主任認可。</p> <p>(5) 由本校電機資訊兩院其他系所或台聯大系統轉入之博士生，經指導教授及學程主任同意，得酌予抵免學分數。</p> <p>(6) 於入學第一學期結束前，須至「台灣學術倫理教育資源中心」平台修習「學術倫理教育」課程，並通過課程總測驗成績達及格標準。未通過總測驗之學生，不得申請學位考試。</p>
備註	本規定亦適用於所有在學生

EECS International Graduate Program Doctoral Degree Curriculum

Academic Year 2023

Minimum Term of Study	Two Years
Minimum Credits	18 Credits
Minimum Credits for Direct PhD	30 credits
Curriculum and Regulations	<p>(1) Complete and fulfill the following course requirements:</p> <ul style="list-style-type: none"> ● 12 credits (minimum) of technical courses from the Colleges of Electrical and Computer Engineering (ECE) or Computer Science (CS) and other 6 credits of technical courses. ● Students get direct admission into doctoral program should complete 30 credits (not including seminar courses) which should contain at least 18 credits of technical courses from the Colleges of Electrical and Computer Engineering (ECE) or Computer Science (CS). ● Complete 2 courses or at least 4 credits of Mandarin Chinese courses. Students who pass Chinese proficiency tests or obtain the master degree from EECS International Graduate Program may waive up to 2 courses or 4 credits. ● Doctoral students in their first and second years of study must take Seminar courses every semester (the credits do not count toward graduation requirements). Students must take and pass 4 Seminars (minimum) before graduation. ● Only Ph.D. transfer students from universities from UST (University System of Taiwan) in Photonics or Computer Science departments could waive seminar course requirements of this program based on the seminar courses taken in their original department. <p>(2) Before registering for courses, students in their first and second years of study must ask their advisor or the program director to approve their course selection.</p> <p>(3) Before the end of the first semester after enrollment, a student must submit an Advisor Agreement Form with four selected qualifying subjects from ECE and CS Colleges approved by the thesis advisor.</p> <p>(4) Transfer students from departments other than the ECE and CS Colleges or other universities from UST (University System of Taiwan) may apply for credit exemption with the approval of their advisor and the program director.</p> <p>(5) Transfer students from departments other than the ECE and CS Colleges or other university of UST (University System of Taiwan) may apply for credit exemption with the approval of their advisor and the program director.</p> <p>(6) Students should study the “Research Ethics Course” on the “Taiwan Academic Ethics Education Resource Center” platform before the end of the first semester after enrollment. Students who fail to pass the final test cannot apply for degree exam.</p>
Notes	This curriculum is applicable to all current students.