

# 電機工程學系碩士班

114 學年度-114.11.12 修訂

最低修業年限	一年
應修學分數	(一)、 專業課程 24 學分 (含抵免學分)。 (二)、 以同等學歷入本班者，得由指導教授增加其畢業學分數。
應修 (應選) 課程及符合畢業資格之修課 相關規定	(一)、 本班開設之論文研討 2 次，丙 C 組學生得選修電子所書報討論抵修或免修本班開設之論文研討。 (二)、 專業必修：6 學分(必修科目一覽表如附件一)，必須皆為電機工程學系碩博士班、電信工程研究所、電控工程研究所、電子研究所(上述四個單位以下簡稱本系所)所開授之研究所課程。 (三)、 專業選修：18 學分，其中 9 學分，必須皆為本系所所開授之研究所課程 (含暑修課程)；其餘 9 學分，得選修台聯大 (含本校) 非暑修研究所課程。修課以電機、資訊相關之研究所課程為限，選修課程需經指導教授同意。 (四)、 本所丙 C 組主修半導體工程與固態電子 (含晶片設計與應用)，應修課程另行規定，詳如必修科目一覽表。
備註	

## 必修科目一覽表

組別	選課	必修科目
甲組	10 選 2	1、超大型積體電路系統設計 2、類比積體電路設計 3、計算機結構 4、微機電系統技術導論 5、演算法 6、功率積體電路設計 7、通訊系統晶片設計 8、影像處理 9、醫學工程 10、數位信(訊)號處理
乙組	10 選 2	1、演算法 2、計算機結構 3、嵌入式作業系統 4、計算機網路 5、機器學習 6、數位信(訊)號處理 7、雲端運算與巨量資料分析 8、隨機過程 9、生成式人工智慧(原課為：資料科學) 10、深度學習
丙 C 組	本組學生依其指導教授領域擇修	<p>【本組學生修課依其指導教授領域擇修】</p> <p>本組學生須修讀本班論文研討 (或電子所書報討論) 2 次外，至少須修滿 24 學分專業課程，其中包括主修組別之專業科目至少 15 學分 (含本班或電子所開設之必選課程 9 學分) 及本班或電子所相關之其它科目 9 學分。</p> <p>★ 固態領域</p> <p>1. 半導體物理及元件(一)。</p> <p>2. 必選課程：五必選二：</p> <p>a. 固態理論 b. 固態物理 c. 高等電磁學(一) d. 量子力學 e. 本班或電子所固態組開設之其他專業課程。</p> <p>★ 系統領域</p> <p>必選課程：七必選三：a. 數位積體電路 b. 類比積體電路 或 射頻積體電路 c. 計算機結構 d. 計算機輔助設計特論或 VLSI 測試與可測試性設計 e. 數位訊號處理或隨機過程 f. 數位通訊或檢測與估計 g. 機器學習或深度學習。</p>

# Master's Degree of the Department of Electronics and Electrical Engineering

Academic Year 114

Minimum Term of Study	One Year
Minimum Credits	A. 24 Credits (include credit transfer). B. Students who enter the Master's Degree with the same academic qualifications may have their graduation credits increased by their advisors.
Curriculum and Regulations	A. Students must select Seminars and Academic Dissertation Research offered by Institute of ECE for two times. B. Core courses: 6 credits (as listed in attachment), must consist of core courses offered by ECE M.S., Institute of Communications Engineering, and Institute of Electrical Control Engineering. C. Elective courses: 18 credits are required, 9 credits of which must consist of graduate courses offered by ECE Department (including courses during Summer Semester). The other 9 credits can be acquired from courses which are not during Summer Semester in University System of Taiwan (including NYCU). Students should take the courses which are master's courses related to electrical engineering and computer science, and should approved by their advisors. D. Group C of the Institute of ECE focuses on Semiconductor Engineering and Solid-State Electronics, including IC Design and Applications. The required courses are listed separately; please refer to the attachment for details.
Notes	

## Required Courses List

Group	Mode	Required Courses
I	Two of Ten	VLSI System Design and Application, Analog IC Design, Introduction to Micro Electro Mechanical Systems, Computer Architecture, Algorithms, Power IC Design, Chip Design for Communication Systems, Digital Image Processing, Biomedical Engineering, Digital Signal Processing
II	Two of Ten	Algorithm, Computer Architecture, Embedded Operating Systems, Computer Network, Machine Learning, Digital Signal Processing, Cloud Computing and Big Date Analytics, Random Process, Generative Artificial Intelligence, Deep Learning
III Group C	Students are required to take courses aligned with the research fields of their academic advisor	<p><b>【Students are required to take courses aligned with the research fields of their academic advisor】</b></p> <p>In addition to completing the Thesis Seminar (or Seminar in the Graduate Institute of ECE) twice, students must earn a minimum of 24 credits in the professional courses. These must include:</p> <ul style="list-style-type: none"> <li>- At least 15 credits in the core courses from the major area that the student selected.</li> <li>- Among these, 9 credits must be selected among the required or elective courses offered by this program or the Graduate Institute of ECE.</li> <li>- The remaining 9 credits must be selected from other relevant courses offered by this program or the Graduate Institute of ECE.</li> </ul> <p>★Solid-State Major</p> <ol style="list-style-type: none"> <li>1. Semiconductor Physics and Devices (I)</li> <li>2. Elective Courses (select 2 out of the following 5)               <ol style="list-style-type: none"> <li>a. Solid State Theory;</li> <li>b. Solid State Physics;</li> <li>c. Advanced Electromagnetics(I);</li> </ol> </li> </ol>

		<ul style="list-style-type: none"> <li>d. Quantum Mechanics;</li> <li>e. Other professional courses in solid-state topics offered by this program or the Graduate Institute of ECE</li> </ul> <p>★System Major</p> <p>Elective Courses (select 3 out of the following 7):</p> <ul style="list-style-type: none"> <li>a. Digital Integrated Circuits;</li> <li>b. Analog Integrated Circuits or Radio-Frequency Integrated Circuits;</li> <li>c. Computer Architecture;</li> <li>d. Special Topics in Computer Aided Design or VLSI Testing and Design for Testability;</li> <li>e. Digital Signal Processing or Stochastic Processes;</li> <li>f. Digital Communication or Detection and Estimation;</li> <li>g. Machine Learning or Deep Learning</li> </ul>
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## 電機工程學系碩士班(輔所)(乙組)

114 學年度

應修學分數	12 學分
應修（應選）課程	電機系碩博士班乙組必修科目任選 2 門，本系所（含電子所）課程任選 2 門。除滿足輔所修課規定外，應敦聘本組教授指導並完成研究論文撰寫。

# 電機工程學系博士班

114 學年度-114.11.12 修訂

最低修業年限	2 年
應修學分數	(一)、 非逕博生：18學分(含抵免學分)。 (二)、 逕博生：24學分（含逕博前修讀之學分），其中至少18學分必須是本系所開設之課程。
應修（應選）課程及符合畢業資格之修課相關規定	(一)、 本班開設之論文研討3次。逕博生可將碩士班修過之論文研討課程一併列入計算。 <u>丙組學生得修醫電所(原生醫所)開設之智慧醫電工程特論(或生醫工程特論)與論文研討</u> 。如有特殊情況得經指導教授同意後專案申請，由本班會議討論。 (二)、 專業必修：9學分(必修科目一覽表如附件一)，須為本系所所開授之研究所課程。 (三)、 專業選修：9學分，其中3學分必須是本系所所開設之研究所課程（含暑修課程）；其餘6學分，得選修台聯大(含本校)非暑修研究所課程。選修課程需經指導教授同意。
備註	

## 必修科目一覽表

組別	選課	必修科目
甲組	8 選3	1、超大型積體電路系統設計2、類比積體電路設計3、微機電系統技術導論、4 計算機結構 5、演算法 6、數位訊號處理 7、功率積體電路設計8、通訊系統晶片設計
乙組	12 選 3	1、演算法 2、計算機結構 3、嵌入式作業系統 4、計算機網路 5、機器學習 6、數位信(訊)號處理 7、隨機過程 8、雲端運算與巨量資料分析 9、檢測與估計理論 10、適應性訊號處理 11、影像處理 12、 <u>生成式人工智慧(原課為：資料科學)</u>
丙組	16 選 3	1、近代生醫電學 2、神經彌補裝置 3、超音波導論與應用 4、生醫信號分析和模擬（本科目於 110 學年度起刪除，不列入必修考科目）5、醫學影像學 6、影像處理（本科目於 114 學年度起刪除，不列入必修科目） 7、聽語資訊處理（本科目於 114 學年度起刪除，不列入必修科目）8、人體結構、功能、臨床及醫療器材 9、生醫化學（原課名為：實用生醫化學）10、奈米與生物技術-原理與實作 奈米生醫感測 11、生物微型檢測技術（原課名為：生物微型分析系統）12、生醫光學檢測-原理與實作 13、生醫材料（本科目於 114 學年度起刪除，不列入必修科目） 15、醫學影像處理 16、醫學影像原理

# Doctoral Degree of the Department of Electronics and Electrical Engineering

Academic Year 114

Minimum Term of Study	Two Year
Minimum Credits	A. Ph.D. students (not direct admitted Ph.D.):18 credits (include credit transfer). B. Direct admitted Ph.D. students:24 credits (include the credits you get before direct admitted Ph.D. ) , and at least 18 credits must offered by Institute of ECE .
Curriculum and Regulations	A. Students must select Seminars and Academic Dissertation Research offered by Institute of ECE for three times. Students who are direct admitted Ph.D. can let the Seminars and Academic Dissertation already taken incorporate into calculation. Group C students have to study the seminar in this institute for at least three semesters. Special Topics on Biomedical Engineering and the seminar in the Institute of Biomedical Engineering can transfer credit points of the seminar in this institute and both of them are limited to once, respectively. In case of special circumstances, the application must be approved by the supervising professor and discussed at the meeting. B. Core courses: 9 credits must consist of core courses offered by Institute of ECE (as listed in attachment). C. Elective courses: 9 credits. In addition to that, 3 of the elective courses must consist of courses offered by Institute of ECE. Elective course must be approved by their advisors.
Notes	

## Required Courses List

Group	Mode	Required Courses
I	Three of Eight	1.VLSI System Design and Application, 2.Analog IC Design, 3.Introduction to Micro Electro Mechanical Systems, 4.Computer Architecture, 5.Algorithms, 6.Power IC Design, 7.Chip Design for Communication Systems, 8.Digital Signal Processing
II	Three of twelve	1.Algorithm, 2.Computer Architecture, 3.Embedded Operating Systems, 4.Computer Network, , 5.Machine Learning, 6.Digital Signal Processing, 7.Cloud Computing and Big Date Analytics, 8.Random Process, 9.Detection and Estimation Theory, 10.Adaptive Sign Processing, 11.Image Processing, 12. Generative Artificial Intelligence
III	Three of sixteen	1、Modern Bioelectricity2、Neural Prostheses3、Introduction to Ultrasound and its Applications 4、Biomedical Signal Analysis and Modeling5、Medical Imaging6、Image Processing 7、Auditory and Acoustical Information Process 8、.Human Function Anatomy and Medical Instrument Application 9、Biomedical Chemistry 10、Nano and Biotechnology-Principle and Practice 11. Nano Biosensing 12. Biomedical Micro Analysis Systems 13. Biomedical Optical Biopsy-Principle 14. Biomedical Materials 15、Medical image processing 16、Fundamentals of Medical Imaging