

長庚大學 電子工程系 大學部必修科目表 (110學年度入學學生適用)

|          |               | 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       | 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 |   | 校外實習/境外實習(Practice School)                                   | 4 |   |
|          |               | 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 |   |   | 專題研究(Seminar)(2)                                             | 1 |   |
|          |               | 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 |   |   | 半導體元件物理導論(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       | 院共構課程         |                                                                     |   |   |   |                                                                          |   |   |   | 英文口說與報告(1)(2)                                                   | 2 | 2 |   |                                                              |   |   |
|          | 共同選修          |                                                                     |   |   |   |                                                                          |   |   |   | 海外研習(Overseas Study)                                            |   | 1 |   | 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 | 海外研習(Overseas Study)                                         | 1 |   |
|          |               | FPGA實作(FPGA Lab)                                                    |   |   | 3 |                                                                          |   |   |   | 類比積體電路實作(Analog IC)                                             |   |   | 3 |                                                              |   |   |
| 四大領域專業選修 | 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 Anaysis 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- Proability 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-          | 3 |   |
|          |               |                                                                     |   |   |   |                                                                          |   |   |   |                                                                 |   |   |   | 天線(Antennas)                                                 | 3 |   |
|          |               |                                                                     |   |   |   |                                                                          |   |   |   |                                                                 |   |   |   | 數位通信積體電路設計(Digital Communication Integrated Circuit Design)  | 3 |   |
|          |               |                                                                     |   |   |   |                                                                          |   |   |   |                                                                 |   |   |   | 數位積體電路設計(Digital 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                             | 3 |   |
|          |               |                                                                     |   |   |   | 計算機組織(Computer)                                                          |   |   | 3 | 數值方法(Numerical Method)                                          |   | 3 |   | 生醫電子學(Biomedical                                             | 3 |   |
|          |               |                                                                     |   |   |   | 訊號與系統(Signal & System)                                                   |   |   | 3 | 積體電路設計實驗(IC Design Lab)                                         |   | 1 |   | DIP設計概論(Advanced DIP                                         | 3 |   |
|          |               |                                                                     |   |   |   | 向量分析與複變函數(Vector Anaysis and Complex Variable)                           |   |   | 3 | 微處理器實驗(Microprocessor Experiments)                              |   | 1 |   | 醫療電子臨床導入(Clinical Application of Medical Electronic          | 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- Proability 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 |   |
|          |               |                                                                     |   |   |   |                                                                          |   |   |   | 嵌入式系統設計與實作(Design and Implementation of Embedded Systems)       |   |   | 4 |                                                              |   |   |
|          |               |                                                                     |   |   |   |                                                                          |   |   |   | 類比積體電路實作(Analog IC design)                                      |   |   | 3 |                                                              |   |   |
|          |               | 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 Anaysis and Complex Variable)                           |   |   | 3 | 半導體實驗(Semiconductor Experiments)                                | 1 | 1 |   | 奈米材料與元件(Nanostructured and Nanotechnology)                   | 3 |   |
|          |               |                                                                     |   |   |   |                                                                          |   |   |   | 半導體製程(VLSI Technology)                                          |   |   | 3 | 元件量測與可靠性 Devices Measurement and                             | 3 |   |

|                    |  |  |  |  |                                                |                                                                         |  |                                                                         |                                                                        |                                  |                                                     |   |
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| 奈米材料<br>製程領域<br>課程 |  |  |  |  |                                                | 工程數學(機率與統計)(Engineering Mathematics- Proability 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                                |                                                     |   |
| 綠能照明<br>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                                                   |   |
|                    |  |  |  |  | 向量分析與複變函數(Vector Anaysis and Complex Variable) | 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 (Proability 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 |

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| 備註 | <p>一、1.畢業學分：129學分。</p> <p>(1)必修73學分(含校外實習必修4學分)。</p> <p>(2)選修27學分：</p> <p>a.系選修至少20學分。</p> <p>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)。</p> <p>c.學院共構選修課程列入他系選修。</p> <p>(3)通識學分：請詳見通識中心修課規定。</p> <p>a.AI領域課程1學分。</p> <p>b.英文領域、核心、多元課程28學分。</p> <p>2.體育大一、大二必修0學分；全民國防教育軍事訓練大一必修0學分。</p> <p>3.【深耕學園】必修0學分，請詳見學務處深耕學園專區說明。</p> <p>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。</p> <p>二、必、選修學分：(常規學期或暑期學制二擇一)</p> <p>◆ 常規學制：必修73學分、選修27學分(含系選修至少20學分、自由學分至多7學分)、通識29學分</p> <p>1. 必修73學分(含校外實習必修4學分)。</p> <p>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，應通過二門選修實驗課。</p> <p>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)。</p> <p>4. 企業實習(1)、(2)最多承認為選修學分6學分。</p> <p>5. 「校外實習」可用「企業實習(1)」或「企業實習(2)」抵免。</p> <p>6. 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。</p> <p>◆ 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</p> <p>1. 必修68學分，抵免「校外實習」及「專題研究(2)」之替代課程，必須取得下列暑期學程課程學分。</p> <p>(1)「跨領域實務專題」</p> <p>(2)「嵌入式系統設計與實作」、「類比積體電路實作」(二擇一)</p> <p>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二門選修實驗課。</p> <p>3. 「電子智慧學程」應修滿15學分。</p> <p>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)。</p> <p>5. 「創意生醫感測電子實驗」得認列為一門選修實驗課。</p> <p>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)。</p> <p>三、擋修課程：</p> <p>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。</p> <p>2. 大二「數位系統設計」先修課程為大一「邏輯設計」達60分。</p> |  |  |  |  |  |  |  |  |  |  |
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系主任簽章：

✓ 莊新 11/14

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