# 國立勤益科技大學日間部四年制109學年度電機工程系學分計畫表

National Chin-Yi University of Technology

Curriculum Planning of 2020 Four-Year Degree in Department of Electrical Engineering

109.04.15系課程委員會議及109.04.30系務會議審議通過
109.5.21.院課程委員會審議通過
109.5.28.校課程委員會議及109.6.11.教務會議審議通過
. 109.12.10.校課程委員會議及109.12.17.教務會議審議修訂通過
110.04.19.系課程委員會議及110.04.22.系務會議審議
110.05.11.院課程委員會議審議通過
110.05.25.校課程委員會議及110.06.15.教務會議審議通過
111.06.02.校課程委員會議及111.06.16.臨時教務會議審議修正通過

| 科目 | Courses | 上學期 Fall Semester | | | 下學期 Spring Semester | | |
|---|---|---|---|---|---|---|---|
| | | 學分 Credit | 正課 Lecture | 實習 Internship | 學分 Credit | 正課 Lecture | 實習 Internship |
| 共同必修科目(30學分) General Required Courses (30credits hours) | | | | | | | |
| 第一學年First Year | | | | | | | |
| 國文(一) | Chinese (Ⅰ) | 3 | 3 | 0 | | | |
| 大一英文(一) | Freshman English (Ⅰ) | 2 | 2 | 0 | | | |
| 英文聽講(一) | Listening and Speaking (Ⅰ) | 1 | 1 | 0 | | | |
| 體育(一) | Physical Education (Ⅰ) | 0 | 2 | 0 | | | |
| 全民國防教育軍事訓練(一) | All-Out Defense Education Military Training (Ⅰ) | 0 | 2 | 0 | | | |
| 勞作與社會服務教育(一) | Labor and Social services Education (Ⅰ) | 0 | 0 | 1 | | | |
| 藝術鑑賞 | Art Appreciation | 1 | 1 | 0 | | | |
| 國文(二) | Chinese (Ⅱ) | | | | 3 | 3 | 0 |
| 大一英文(二) | Freshman English (Ⅱ) | | | | 2 | 2 | 0 |
| 英文聽講(二) | Listening and Speaking (Ⅱ) | | | | 1 | 1 | 0 |
| 體育(二) | Physical Education (Ⅱ) | | | | 0 | 2 | 0 |
| 全民國防教育軍事訓練(二) | All-Out Defense Education Military Training (Ⅱ) | | | | 0 | 2 | 0 |
| 勞作與社會服務教育(二) | Labor and Social services Education (Ⅱ) | | | | 0 | 0 | 1 |
| 音樂鑑賞 | Music Appreciation | | | | 1 | 1 | 0 |
| 第二學年Second Year | | | | | | | |
| 憲法與民主 | Constitution and Democracy | 2 | 2 | 0 | | | |
| 體育(三) | Physical Education (Ⅲ) | 0 | 2 | 0 | | | |
| 博雅通識課程 | Liberal Education | 2 | 2 | 0 | | | |
| 博雅通識課程 | Liberal Education | 2 | 2 | 0 | | | |
| 體育(四) | Physical Education (Ⅳ) | | | | 0 | 2 | 0 |
| 博雅通識課程 | Liberal Education | | | | 2 | 2 | 0 |
| 第三學年Third Year | | | | | | | |
| 歷史與文化(一) | History and Culture (Ⅰ) | 2 | 2 | 0 | | | |
| 博雅通識課程 | Liberal Education | 2 | 2 | 0 | | | |
| 歷史與文化(二) | History and Culture (Ⅱ) | | | | 2 | 2 | 0 |
| 博雅通識課程 | Liberal Education | | | | 2 | 2 | 0 |
| 第四學年Fourth Year(無必修課程No General Required Courses) | | | | | | | |
| 專業必修科目(71學分) Department Required Courses(71credits hours) | | | | | | | |
| 第一學年First Year | | | | | | | |
| ●微積分(一) | Calculus (Ⅰ) | 3 | 3 | 0 | | | |
| ●物理(一) | Physics (Ⅰ) | 3 | 3 | 0 | | | |
| ●電路學(一) | Electric Circuit Analysis (Ⅰ) | 3 | 3 | 0 | | | |
| ●計算機概論 | Basic Concept of Computer | 3 | 3 | 0 | | | |
| ●邏輯設計 | Logic Circuit Design | 3 | 3 | 0 | | | |
| ●微積分(二) | Calculus (Ⅱ) | | | | 3 | 3 | 0 |
| ●物理 (二) | Physics (Ⅱ) | | | | 3 | 3 | 0 |
| ●電路學 (二) | Electric Circuit Analysis (Ⅱ) | | | | 3 | 3 | 0 |
| ●計算機程式 | Computer Program | | | | 3 | 3 | 0 |
| ●計算機程式實習 | Computer Programming Practice | | | | 1 | 0 | 3 |
| ●工業配電設計 | Industrial Distribution Design | | | | 3 | 3 | 0 |
| 第二學年Second Year | | | | | | | |
| ●電子學 (一) | Electronics (Ⅰ) | 3 | 3 | 0 | | | |
| ●電子實習 (一) | Electronics Lab (Ⅰ) | 1 | 0 | 3 | | | |
| ●工程數學 (一) | Engineering Mathematics (Ⅰ) | 3 | 3 | 0 | | | |
| ●微處理機及實習 | Microprocessor Experiment | 3 | 2 | 2 | | | |
| ●工業配電設計實習 | Industrial Distribution Design Practice | 1 | 0 | 3 | | | |
| ●電子學 (二) | Electronics (Ⅱ) | | | | 3 | 3 | 0 |
| ●電子實習 (二) | Electronics Lab (Ⅱ) | | | | 1 | 0 | 3 |
| ●工程數學 (二) | Engineering Mathematics (Ⅱ) | | | | 3 | 3 | 0 |
| ●電機機械 | Electric Machinery | | | | 3 | 3 | 0 |
| ●電力電子學 | Power Electronics | | | | 3 | 3 | 0 |
| 第三學年Third Year | | | | | | | |

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|---|---|---|---|---|---|---|---|
| ●實務專題（一） | Project study （Ⅰ） | 2 | 0 | 6 | | | |
| ●電機機械實習 | Electric Machinery Practice | 1 | 0 | 3 | | | |
| ●自動控制 | Automatic Controls | 3 | 3 | 0 | | | |
| ●電機控制 | Motor Drives | 3 | 3 | 0 | | | |
| ●電力電子學實習 | Experiments of Power Electronics | 1 | 0 | 3 | | | |
| ●實務專題（二） | Project study （Ⅱ） | | | | 2 | 0 | 6 |
| ●電力系統 | Power System | | | | 3 | 3 | 0 |
| ●電機控制實習 | Motor Drives Experiment | | | | 1 | 0 | 3 |
| 第四學年Fourth Year（無排定必修課程No Department Required Courses） | | | | | | | |

| 科目 | Courses | 上學期 Fall Semester | | | 下學期 Spring Semester | | |
|---|---|---|---|---|---|---|---|
| | | 學分 Credits | 正課 Lecture | 實習 Internship | 學分 Credits | 正課 Lecture | 實習 Internship |
| 共同選修科目 General Elective Courses | | | | | | | |
| 第一學年 First Year(無排定共同選修課程 No General Elective Courses) | | | | | | | |
| 第二學年 Second Year | | | | | | | |
| 全民國防教育軍事訓練(三) | All-Out Defense Education Military Training（Ⅲ） | 1 | 2 | 0 | | | |
| 全民國防教育軍事訓練(四) | All-Out Defense Education Military Training（Ⅳ） | | | | 1 | 2 | 0 |
| 第三學年 Third Year | | | | | | | |
| 體育選修 | Physical Elective Course | 1 | 2 | 0 | 1 | 2 | 0 |
| 全民國防教育軍事訓練(五) | All-Out Defense Education Military Training（Ⅴ） | 1 | 2 | 0 | | | |
| 第四學年 Fourth Year | | | | | | | |
| 體育選修 | Physical Elective Course | 1 | 2 | 0 | 1 | 2 | 0 |
| 專業選修科目 Department Elective Courses | | | | | | | |
| 第一學年 First Year | | | | | | | |
| 計算機應用領域選修 Computer Application Field Elective Courses | | | | | | | |
| ●數位 IC 應用設計及實習 | Digital IC Application Design and Experiment | 3 | 2 | 2 | | | |
| ●數位電路晶片設計及實習 | CPLD/FPGA Chip Application Design and Practical | | | | 3 | 2 | 2 |
| 機電控制領域選修 Mechanical & Electrical Control Field Elective Courses | | | | | | | |
| ●PLC 應用及實習 | PLC Application and Practice | 3 | 2 | 2 | | | |
| ●系統晶片概論 | Introduction to System on Chip | | | | 3 | 3 | 0 |
| 電能科技領域選修 Power & Energy Technology Field Elective Courses | | | | | | | |
| ●電機概論 | Introduction to Electric | | | | 3 | 3 | 0 |
| ●電腦輔助繪圖設計及實習 | Computer Aided Drawing (CAD) and Practice | | | | 3 | 2 | 2 |
| 其它專業選修課程 Other Elective Courses | | | | | | | |
| ●光電概論 | Introduction to Electro-optics | 3 | 3 | 0 | | | |
| ●能源應用 | Energy Application | 3 | 3 | 0 | | | |
| ●電機工程概論與職場倫理 | Introduction to Electrical Engineering and Ethics in | 1 | 1 | 0 | | | |
| ●生命關懷 | Caring for Life | | | | 3 | 3 | 0 |
| ●工程日文 | Engineering Japanese | | | | 3 | 3 | 0 |
| 第二學年 Second Year | | | | | | | |
| 計算機應用領域選修 Computer Application Field Elective Courses | | | | | | | |
| ●視窗程式設計及實習 | Windows Programming and Experiments | 3 | 2 | 2 | | | |
| ●圖控程式設計及實習 | Graphical computer program and experiment | 3 | 2 | 2 | | | |
| ●物件導向程式設計及實習 | Object Oriented Programming and Practice | 3 | 2 | 2 | | | |
| ●信號與系統 | Signals and Systems | | | | 3 | 3 | 0 |
| ●電腦網路概論 | Introduction to Computer Network | | | | 3 | 3 | 0 |
| ●Python 程式設計 | Basic Python programming | | | | 3 | 3 | 0 |
| ●「EMI」印刷電路設計及實習 | Development and assessment of a printed | | | | | | |
| ●工程儀表與量測 | Instrumentation and Measurement | | | | 3 | 3 | 0 |
| 機電控制領域選修 Mechanical & Electrical Control Field Elective Courses | | | | | | | |
| ●油氣壓應用 | The Application of Fluid Power System and | 3 | 3 | 0 | | | |
| ●介面控制及實習 | Interface Control & Experiments | | | | 3 | 2 | 2 |
| ●「EMI」物聯網電子系統應用 | IoT Electronic Systems Applications and | | | | 3 | 3 | 0 |
| ●工業電子學及實習 | Industrial Electronics/Experiments | | | | 3 | 2 | 2 |
| 電能科技領域選修 Power & Energy Technology Field Elective Courses | | | | | | | |
| ●消防工程設計 | Design of fire fighting system | 3 | 3 | 0 | | | |
| ●分散式發電技術簡介 | Introduction to Distributed Generation Technology | 3 | 3 | 0 | | | |
| ●電能儲存技術 | Energy Storage Technologies | | | | 3 | 3 | 0 |
| ●節能技術 | Energy Conservation Technology | | | | 3 | 3 | 0 |
| ●監控系統設計及實習 | SCADA Design and Practice | | | | 3 | 2 | 2 |
| ●新能源車介紹 | Introduction of New Energy Vehicles | | | | 3 | 3 | 0 |
| 其它專業選修課程 Other Elective Courses | | | | | | | |
| ●科技英文 | English for Science and Technology | 3 | 3 | 0 | | | |
| ●電機應用 | Electrical Machine Applications | 3 | 3 | 0 | | | |
| ●數值分析 | Numerical analysis | 3 | 3 | 0 | | | |

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|---|---|---|---|---|---|---|---|
| ●校外實習(寒假)一 | Extracurricular Intern (winter vacation) I | 1 | 0 | 1 | | | |
| ●網路語言 I/O 應用及實習 | Network Programming and I/O Application | | | | 3 | 2 | 2 |
| ●線性代數 | Linear Algebra | | | | 3 | 3 | 0 |
| ●機率 | Probability | | | | 3 | 3 | 0 |
| ●校外實習(暑期)一 | Extracurricular Intern (summer vacation) I | | | | 3 | 0 | 3 |
| ●師徒實務專題(一) | Mentor-Apprentice Project study (I) | | | | 3 | 0 | 3 |
| **第三學年 Third Year** | | | | | | | |
| 計算機應用領域選修 Computer Application Field Elective Courses | | | | | | | |
| ●通訊系統 | Communication System | 3 | 3 | 0 | | | |
| ●嵌入式系統設計及實習 | Embedded system design and experiment | 3 | 2 | 2 | | | |
| ●數位影像處理及實習 | Digital Image Processing and Practice | 3 | 2 | 2 | | | |
| ●計算機結構 | Computer Architecture | 3 | 3 | 0 | | | |
| ●專業軟體應用及實習 | Expert Program Design And Application | 3 | 2 | 2 | | | |
| ●行動加值開發實務 | Practical Programming of Mobile Value-Added | 3 | 2 | 2 | | | |
| ●Python 程式應用 | Applications for Python | 3 | 3 | 0 | | | |
| ●MATLAB 程式設計及實習 | MATLAB Programming and Practice | 3 | 2 | 2 | | | |
| ●微控制器應用及實習 | Microcontroller Application and Practice | | | | 3 | 2 | 2 |
| ●電腦硬體裝修實務 | Computer hardware decoration Practice | | | | 3 | 2 | 2 |
| ●超大型積體電路設計及實習 | Introduction to Very Large Scale Integration (VLSI) Design and Experiment | | | | 3 | 2 | 2 |
| ●Android 應用程式及實習 | Android Application Development and Practice | | | | 3 | 2 | 2 |
| ●JAVA 程式設計及實習 | JAVA Language Programming and Practice | | | | 3 | 2 | 2 |
| 機電控制領域選修 Mechanical & Electrical Control Field Elective Courses | | | | | | | |
| ●人機介面設計及實習 | Human Computer Interface Design and Practice | 3 | 2 | 2 | | | |
| ●感測器應用及實習 | Sensor Application/Experiments | 3 | 2 | 2 | | | |
| ●生醫工程概論 | Introduction to biomedical engineering | 3 | 3 | 0 | | | |
| ●RFID 應用 | RFID theorem and practice | 3 | 3 | 0 | | | |
| ●網路交換技術 | Internet Switching Technology | 3 | 2 | 2 | | | |
| ●物聯網電子系統應用與設計 | IoT Electronic Systems | 3 | 3 | 0 | | | |
| ●生醫感測技術實習 | Biosensing Technology and Practice | | | | 3 | 2 | 2 |
| ●無線感測網路 | Wireless Sensors Networks | | | | 3 | 3 | 0 |
| ●伺服控制 | Servo Control System | | | | 3 | 3 | 0 |
| ●控制系統 | Control system | | | | 3 | 3 | 0 |
| ●智慧電子應用設計及實習 | Intelligent Electronics Design Applications and Practice | | | | 3 | 2 | 2 |
| 電能科技領域選修 Power & Energy Technology Field Elective Courses | | | | | | | |
| ●發變電工程 | Generation Transformation Engineering | 3 | 3 | 0 | | | |
| ●照明設計 | Lighting Design | 3 | 3 | 0 | | | |
| ●高電壓工程 | High Voltage Engineering | 3 | 3 | 0 | | | |
| ●太陽能面板設計原理 | Design Principles of Solar Panel | 3 | 3 | 0 | | | |
| ●燃料電池概論 | Introduction to Fuel Cells | 3 | 3 | 0 | | | |
| ●再生能源技術 | Renewable Energy Technology | | | | 3 | 3 | 0 |
| ●燃料電池技術開發與應用 | Fuel Cell Development and Application | | | | 3 | 3 | 0 |
| ●電腦輔助電機設計及實習 | Computer aided design (CAD) of electrical machinery & practice | | | | 3 | 2 | 2 |
| ●電池概論 | Introduction to Batteries | | | | 3 | 3 | 0 |
| ●電化學動力技術：二次電池 | Electrochemical Power Technology: Secondary Battery | | | | 3 | 3 0 | 0 |
| 其它專業選修課程 Other Elective Courses | | | | | | | |
| ●電子電路 | Electronic Circuit | 3 | 3 | 0 | | | |
| ●網路分析 | Network Analysis | 3 | 3 | 0 | | | |
| ●綠色能源工程 | Green Energy Engineering | 3 | 3 | 0 | | | |
| ●電磁學 | Basic Electromagnetics | 3 | 3 | 0 | | | |
| ●校外實習(寒假)二 | Extracurricular Intern (winter vacation) II | 1 | 0 | 1 | | | |
| ●線性 IC 應用及實習 | Linear IC Applications and Experiments | | | | 3 | 2 | 2 |
| ●[AI]模糊理論及應用 | Fuzzy Theory and Applications | | | | 3 | 3 | 0 |
| ●網路監控程式設計及應用 | Design and Application of Network | | | | 3 | 2 | 2 |
| ●數位通訊系統 | Digital Communication System | | | | 3 | 3 | 0 |
| ●資訊網路 | Information Networks | | | | 3 | 3 | 0 |
| ●校外實習(暑期)二 | Extracurricular Intern (summer vacation) | | | | 3 | 0 | 3 |
| **第四學年 Fourth Year** | | | | | | | |
| 計算機應用領域選修 Computer Application Field Elective Courses | | | | | | | |
| ●電腦軟體應用及實習 | Computer software application and practice | 3 | 2 | 2 | | | |
| ●多媒體應用 | Multimedia Technology and Application | 3 | 3 | 0 | | | |
| ●電控系統 | Electrical Control | 3 | 2 | 2 | | | |
| ●網路多媒體嵌入式系統設計 | Network Multimedia Embedded System Design | 3 | 2 | 2 | | | |
| ●雲端運算技術 | Cloud Computing Technology | 3 | 3 | 0 | | | |

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|---|---|---|---|---|---|---|---|
| ●DSP 晶片應用及實習 | DSP Chip Applications and Experiments | | | | 3 | 2 | 2 |
| ●高科技專利取得與攻防 | High Tech Patent Application & Protection | | | | 3 | 3 | 0 |
| ●數位信號處理及實習 | Digital Signal Processing and Practice | | | | 3 | 2 | 2 |
| 機電控制領域選修 Mechanical & Electrical Control Field Elective Courses | | | | | | | |
| ●控制系統實務 | Control System Practice | 3 | 2 | 2 | | | |
| ●系統動態模擬 | System Dynamic Simulation | 3 | 2 | 2 | | | |
| ●系統晶片設計實務 | System on Chips Design and Practice | 3 | 2 | 2 | | | |
| ●連網型系統晶片嵌入式軟體 | Networked SOC Embedded Software | 3 | 3 | 0 | | | |
| ●機電整合及實習 | Mechatronic & Experiments | | | | 3 | 2 | 2 |
| ●驅動器設計技術 | Driver Design Technology | | | | 3 | 3 | 0 |
| ●無線感測網路實習 | Wireless Sensor Networks and Practice | | | | 1 | 0 | 3 |
| 電能科技領域選修 Power & Energy Technology Field Elective Courses | | | | | | | |
| ●電能技術實務 | Power Technology and Practice | 1 | 0 | 3 | | | |
| ●電力品質 | Electric Power Quality | 3 | 3 | 0 | | | |
| ●切換式電源轉換器設計及實習 | and Practice of Switching Power Supply | 3 | 2 | 2 | | | |
| ●太陽能工程 | Energy Engineering Practices | 3 | 3 | 0 | | | |
| ●太陽光電發電系統設計及應用 | Design and Practice of Solar Photovoltaic Systems | 3 | 3 | 0 | | | |
| ●風力發電工程 | Wind Power System Practical Cases | 3 | 3 | 0 | | | |
| ●配電系統自動化 | Distribution System Automation | 3 | 3 | 0 | | | |
| ●最佳化電機設計及實習 | Optimal Design of Electrical Machinery and Practice | 3 | 2 | 2 | | | |
| ●捷運機電系統概論 | Introduction on MRT Electro-Mechanical- | | | | 3 | 3 | 0 |
| ●電力監控 | Power Supervisory Control | | | | 3 | 3 | 0 |
| ●風力發電工程實務 | Wind power system practical cases | | | | 3 | 3 | 0 |
| ●電機設備保護及實習 | Electrical Power Distribution Design | | | | 3 | 2 | 2 |
| ●電動車設計與製作 | Introduction of New Energy Vehicles | | | | 3 | 3 | 0 |
| 其它專業選修課程 Other Elective Courses | | | | | | | |
| ●[AI]人工智慧 | Artificial Intelligence | 3 | 3 | 0 | | | |
| ●工業安全衛生 | Industrial Safety Health | 3 | 3 | 0 | | | |
| ●個人行銷與形象管理 | Personal Marketing and Image Management | 3 | 3 | 0 | | | |
| ●校外實習(寒假)三 | Extracurricular Intern (winter vacation) | 1 | 0 | 1 | | | |
| ●校外實習(一) | Extracurricular Intern (I) | 9 | 0 | 9 | | | |
| ●工程經濟 | Engineering Economy | | | | 3 | 3 | 0 |
| ●[AI]類神經網路 | Artificial Neural Networks | | | | 3 | 3 | 0 |
| ●工廠管理 | Factory Management | | | | 3 | 3 | 0 |
| ●特殊空調系統 | Distinctive Air-Conditioning | | | | 3 | 3 | 0 |
| ●線性馬達概論 | Linear Motor Theory Fundamentals | | | | 3 | 3 | 0 |
| ●校外實習(二) | Extracurricular Intern (II) | | | | 9 | 0 | 9 |
| ●師徒實務專題 (二) | Mentor-Apprentice Project study (Ⅱ) | 3 | 0 | 3 | | | |

備註 Note:

一. 畢業至少應修滿 133 學分【必修 101 學分，選修至少 32 學分(其中至少需含本系專業選修 22 學分，選修學分內必須修習三門以上(含)具有實驗(習)課之課程，但不包括師徒實務專題(一)、(二))】
Students should complete at least 133 credits before graduation including 101 required credits and 32 elective credits (at least 22 professional elective credits containing no less than three experimental courses in EE, but not include the Mentor-Apprentice Project study(I) and (Ⅱ)).

二. 本校訂有「國立勤益科技大學學生英文及資訊能力與服務學習畢業門檻辦法」，請依規定辦理。
Please follow the rule of English, Computer Ability and Service Learning Graduation Threshold in National Chin-Yi University of Technology.

三. 通識教育學院所開設之「博雅通識課程」學分數（時）為 2 學分 2 學時或 3 學分 3 學時，經 101 學年度第二學期校課程委員會會議通過。
Liberal Arts General Study courses opened by College of General Education, are divided into 2 hours course with 2 credits or 3 hours course with 3 credits, ratified by Course Committee in 2012.

四. 考取本系學生核心證照可抵免：
Students who get core certifications can apply to waive one of the following options:
一張(含以上)證照僅限抵一門具有實驗(習)課程之畢業門檻(不可抵畢業學分)，僅限抵免一次。
One (or above) certification can transfer one experimental course only one time (no transfer graduation credits).

**五. 課程名稱前有標示「AI」符號者，為「人工智慧相關課程」。**
**Courses with an "AI" refer to an artificial intelligence related course.**

六. ~~六.~~課程名稱前有標示「●」符號者，為「職能專業課程」。
Courses with a "●" refer to a professional competence course.