

國立勤益科技大學 108 學年度日間部四年制冷凍空調與能源系 **環境控制組** 學分計畫表

National Chin-Yi University of Technology  
Curriculum Planning of 2019 Four-Year Degree in Environmental Control Group of Department of Refrigeration, Air-Conditioning, and Energy Engineering

108.03.07 107 學年度第 2 學期第一次系課程會議通過  
108.03.21 107 學年度第 2 學期第二次系務會議通過  
108.05.07 107 學年度第 2 學期第三次系課程會議通過  
108.05.09 107 學年度第 2 學期第三次系務會議通過  
108.5.9.院課程會議審議通過  
108.5.21.校課程委員會及 108.5.30.教務會議審議通過  
108.11.07 108 學年度第 1 學期第二次系課程會議修正通過  
108.11.14 108 學年度第 1 學期第三次系務會議及 108.11.19 院課程修正通過  
108.12.10.校課程委員會及 108.12.19.教務會議審議修正通過  
109.12.10.校課程委員會及 109.12.17.教務會議審議修正通過  
110.05.25.校課程委員會及 110.06.15.教務會議審議修正通過  
1110920 系課程會議及 1110922 系務會議修正通過  
111.11.29.院課程會議審議修正通過  
111.12.13.校課程會議及 111.12.22.臨時教務會議審議通過

科目	Courses	上學期 First Semester			下學期 Second Semester		
		學分 Credits	正課 Lecture	實習 Internship	學分 Credits	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			
歷史與文化(一)	History and Culture ( I )	2	2	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			
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
歷史與文化(二)	History and Culture ( II )				2	2	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
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							
藝術鑑賞	Art Appreciation	1	1	0			
音樂鑑賞	Music Appreciation				1	1	0
博雅通識課程	Liberal Education	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(72 學分) Department Required Courses (72credits hours)							
第一學年 First Year							
微積分(一)	Calculus ( I )	3	3	0			
物理(一)	Physics ( I )	3	3	0			
電子學及實習(一)	Electronics and Lab ( I )	2	1	3			
電路學	Electric Circuit Analysis	3	3	0			
工程倫理	Ethics in Engineering	1	1	0			
微積分(二)	Calculus ( II )				3	3	0
熱力學	Thermodynamics				3	3	0
電腦輔助繪圖	Computer Aided Drawing				3	3	0
電子學及實習(二)	Electronics and Lab ( II )				2	1	3

環境控制概論	Introduction to Environment Control				1	1	0
第二學年 Second Year							
工程數學(一)	Engineering Mathematics ( I )	3	3	0			
流體力學	Fluid Mechanics	3	3	0			
電機應用及實習	Electrical Application and Practices	3	2	2			
冷凍空調原理	Principle of Refrigeration and Air-Conditioning	3	3	0			
計算機程式	Computer Program	2	1	2			
工程數學(二)	Engineering Mathematics ( II )				3	3	0
自動控制	Automatic Control				3	3	0
單晶片應用及實習	The Application of Single Chip Micro Controllers and Lab				3	2	2
熱傳學	Heat Transfer				3	3	0
第三學年 Third Year							
空調工程及實習	Air- Condition Engineering and Practices	2	1	3			
冷凍工程及實習	Refrigeration Engineering and Practices	2	1	3			
太陽能工程	Solar Energy Engineering	3	3	0			
冷凍空調節能技術及實習	Refrigeration and Air-Conditioning Energy Saving Technique and Practices				2	1	3
能源工程原理及實習	Energy Engineering Principle and Practices				3	2	2
冷凍空調設計與實習	Refrigeration and Air-Conditioning Design and Practices				3	2	2
實務專題(一)	Project Study ( I )				2	0	6
第四學年 Fourth Year							
實務專題(二)	Project Study ( II )	2	0	6			
室內環境品質	Indoor Air Quality	3	3	0			
科目	Courses	上學期 First Semester			下學期 Second Semester		
		學分 Credit s	正課 Lectur e	實習 Interns hip	學分 Credits	正課 Lectur e	實習 Interns hip
共同選修科目 General Electives Courses							
第一學年 First Year(無排定共同選修課程 No General Electives 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 Electives Courses							
第一學年 First Year(無排定 No Department Required Courses)							
第二學年 Second Year							
工業儀表	Industrial Instrument	3	3	0			
網路分析	Network Analysis	3	3	0			
工程軟體應用及實習	Application and Practices of Engineering Software	3	2	2			
用電設備檢驗	Power Electricity Equipment Inspection	3	2	2			
PC-Base PLC 應用及實習	Application and Practices of PC-Based PLC	3	2	2			
● 冷凍空調基礎裝修實務	Basic Practices of Refrigeration and Air-Conditioning	3	2	2			
變頻空調實務(一)	Variable Frequency Air-Conditioning Practices( I )	3	2	2			
低溫工程	Cryogenic Engineering				3	3	0
電工學理論與分析	Theory and Analysis of Basic Electric Machines				3	3	0
電力電子學	Power Electronics				3	3	0
冷凍冷藏應用技術	Application Technique of Freezing and Cold Storage				3	3	0

線性電路	Linear Circuits				3	3	0
電腦軟體應用及實習	Application and Practices of Computer Software				3	2	2
校外實習(暑期)	Intern Practice ( outside-school ) on summer session				3	0	3
流體機械	Fluid Machinery				3	3	0
變頻空調實務(二)	Variable Frequency Air-Conditioning Practices ( II )				3	2	2
物理(二)	Physics ( II )				3	3	0
●冷凍空調裝修實務	Practice of Refrigeration and Air-Conditioning Installation and Maintenance				3	2	2
第三學年 Third Year							
高等工程數學	Advanced Engineering Mathematics	3	3	0			
現代控制	Modern Control	3	3	0			
虛擬儀控軟體應用	Virtual Instrument Applications	3	3	0			
燃料電池概論	Introduction to Fuel Cells	3	3	0			
變頻節能控制	Variable Frequency Energy- Saving Control	3	3	0			
創意發明	Creative Invention	3	3	0			
●冷凍空調裝修實務	Practice of Refrigeration and Air-Conditioning Installation and Maintenance	3	2	2			
數位控制	Digital Control	3	3	0			
變頻空調實務(三)	Variable Frequency Air-Conditioning Practices ( III )	3	2	2			
綠建築評估技術	Green Building Evaluation Technique	3	3	0			
材料力學	Mechanics of Materials	3	3	0			
電腦輔助機械設計	Computer-Aided Mechanical Design	3	3	0			
消防工程概論	Introduction to Fire Fighting Engineering				3	3	0
電子設備冷卻技術	Cooling Technique of Electronic Equipment				3	3	0
冷凍空調設備與實習	Equipment and Practices of Refrigeration and Air-Conditioning				3	2	2
線性代數	Linear Algebra				3	3	0
智慧財產權	Intellectual Property Rights				3	3	0
氫能技術概論	Introduction to Hydrogen Energy Technology				3	3	0
冷凍空調管路系統設計	Air-Conditioning Piping and Duct System Design				3	3	0
變頻空調實務(四)	Variable Frequency Air-Conditioning Practices ( IV )				3	2	2
模糊控制概論	Introduction to Fuzzy Control				3	3	0
能源與永續發展	Energy and sustainable development				3	3	0
太陽光電安裝實習	Solar Photoelectricity Installation Practice				3	3	0
機械製造	Machinery Manufacturing				3	3	0
專題師徒實習(一)	Mentor-Apprentice Internship Course for Project(I)	3	0	3			
師徒實務專題(一)	Mentor-Apprentice Project study ( I )	3	0	3			
第四學年 Fourth Year							
工業安全	Industry Safety	3	3	0			
冷凍空調系統故障分析	Refrigeration and Air-Conditioning System Diagnostic	3	3	0			
振動與噪音控制	Vibration and Noise Control.	3	3	0			
熱交換器設計	Heat Exchanger Design and Analysis	3	3	0			
無塵室技術	Cleanroom Technology	3	3	0			
科技日文	Japanese for Science and Technology	3	3	0			
風力發電	Wind Power	3	3	0			
工具機冷卻系統設計與開發	Design and Development of Machine Tool Cooling System	3	3	0			
太陽光電系統檢測實習	Solar PV Technique	3	3	0			
壓縮機設計實務	Compressor Design Practice	3	3	0			
智慧型微控器應用	Intelligent Microcontroller Application	3	3	0			
流場分析專業軟體應用	Applications of Computational Fluid Dynamics Package				3	3	0
特殊空調系統	Distinctive Air-Conditioning System				3	3	0
通風工程	Ventilation Engineering				3	3	0
工商應用文書	Business Application Documents				3	3	0

綠建築與照明節能	Energy Saving of Green Building and Lighting				3	3	0
工具機組裝技術與實習	Technique and Practices of Machine Tool Assembling				3	2	2
校外實習(一)	Practical Training (I)				9	0	9
冷凍空調工程規劃與管理	Planning and Management of Refrigeration and Air- Conditioning Engineering				3	3	0
綠建築評估	Green Building Evaluation				3	3	0
師徒實務專題 (二)	Mentor-Apprentice Project study ( II )				3	0	3
專題師徒實習(二)	Mentor-Apprentice Internship Course for Project(II)				3	0	3

備註 Note:

一、畢業至少應修滿 138 學分【必修 102 學分，選修至少 36 學分(須含本系專業選修至少 30 學分)】

Students should complete at least 138 credits before graduation, including 102 required credits, 36 elective credits (elective credits should have at least 30 credits from department elective courses).

二、本校訂有「國立勤益科技大學學生畢業門檻辦法」，請依規定辦理。

Our school has established the "National Chin-yi University of Science and Technology Student Graduation Threshold Measures" , please follow the regulations.

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 Education 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、畢業前需取得冷凍空調裝修丙級技術士(含)以上、太陽光電設置(乙級)證照或室內配線(丙級)資格。Qualification above Grade C (including C) technician needs to be obtained before graduation.

五、環境控制組應修習下列專業課程：

The Environmental Control Group should complete the following department required courses and at least 3 elective courses:

班級	證照持有條件	入學前已有冷凍空調裝修 乙級證照 (7 選 2)	入學前已有冷凍空調裝修 丙級證照 (8 選 2)	入學前尚未持有冷凍空調 裝修乙、丙級證照 (8 選 3)
環境控制組 (乙班)		1. 現代控制 Modern Control 2. 虛擬儀控軟體應用 Virtual Instrument Applications 3. 振動與噪音控制 Vibration and Noise Control 4. 綠建築與照明節能 Energy Saving of Green Building and Lighting 5. 冷凍空調工程規劃及 管理 Planning and Management of Refrigeration and Air- Conditioning Engineering 6. 特殊空調系統 Distinctive Air- Conditioning System 7. 通風工程 Ventilation Engineering	1. 現代控制 Modern Control 2. 虛擬儀控軟體應用 Virtual Instrument Applications 3. 振動與噪音控制 Vibration and Noise Control 4. 綠建築與照明節能 Energy Saving of Green Building and Lighting 5. 冷凍空調工程規劃 及管理 Planning and Management of Refrigeration and Air- Conditioning Engineering 6. 特殊空調系統 Distinctive Air- Conditioning System 7. 通風工程 Ventilation Engineering 8. 冷凍空調裝修實務 Practice of Refrigeration and Air-Conditioning Installation and Maintenance	1. 現代控制 Modern Control 2. 虛擬儀控軟體應用 Virtual Instrument Applications 3. 振動與噪音控制 Vibration and Noise Control 4. 綠建築與照明節能 Energy Saving of Green Building and Lighting 5. 冷凍空調工程規劃 及管理 Planning and Management of Refrigeration and Air- Conditioning Engineering 6. 特殊空調系統 Distinctive Air- Conditioning System 7. 通風工程 Ventilation Engineering 8. 冷凍空調基礎裝修 實務或冷凍空調裝 修實務 Basic Practices of Refrigeration and Air-Conditioning, Practice of Refrigeration and Air-Conditioning Installation and

			Maintenance
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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