

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學分計畫表

National Chin-Yi University of Technology

Curriculum Planning of 2019 Four-Year Degree in 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. 校課程委員會議及 108.5.30. 教務會議審議通過

109.02.26 系課程會議、109.03.05 系務會議及 109.11.24. 院課程會議審議通過

109.12.10. 校課程委員會議及 109.12.17. 教務會議審議修正通過

110.05.25. 校課程委員會議及 110.06.15. 教務會議審議修正通過

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
<b>共同必修科目(30 學分) General Required Courses (30credits hours)</b>							
<b>第一學年 First Year</b>							
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
<b>第二學年 Second Year</b>							
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
<b>第三學年 Third Year</b>							
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
<b>第四學年 Fourth Year (無必修課程 No General Required Courses)</b>							
<b>專業必修科目(78 學分) Department Required Courses (78credits hours)</b>							
<b>第一學年 First Year</b>							
微積分(一)	Calculus ( I )	3	3	0			
物理(一)	Physics ( I )	3	3	0			
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
工程力學	Engineering Mechanics				3	3	0
電機應用	Electric Machinery Applications				3	3	0
計算機程式	Computer Program				2	1	2
<b>第二學年 Second Year</b>							
工程數學(一)	Engineering Mathematics ( I )	3	3	0			
熱傳學	Heat Transfer	3	3	0			
冷凍系統原理	Principle of Refrigeration System	3	3	0			
冷凍工程	Refrigeration Engineering	3	3	0			
能源工程	Energy Engineering				3	3	0
空調系統原理	Principle of Air Conditioning System				3	3	0
流體力學	Fluid Mechanics				3	3	0
工程數學(二)	Engineering Mathematics ( II )				3	3	0
空調工程	Air -Conditioning Engineering				3	3	0
<b>第三學年 Third Year</b>							
自動控制	Automatic Control	3	3	0			

太陽能工程	Solar Energy Engineering	3	3	0			
變頻節能技術	Frequency-Conversion Energy Saving Technology	3	3	0			
機電與能源實習	Practices of Mechatronics and Energy	2	0	4			
電腦輔助繪圖	Computer Aided Drawing				3	3	0
流場分析專業軟體應用	Applications of Computational Fluid Dynamics Package				3	3	0
冷凍空調設計與實習	Design of Refrigeration and Air-Conditioning				3	2	2
冷凍空調節能技術	Energy Saving of Refrigeration and Air -Conditioning Technique				3	3	0
實務專題(一)	Project Study ( I )				2	0	6
<b>第四學年 Fourth Year</b>							
實務專題(二)	Project Study ( II )	2	0	6			
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
<b>共同選修科目 General Electives Courses</b>							
<b>第一學年 First Year(無排定共同選修課程 No General Electives Courses)</b>							
<b>第二學年 Second Year</b>							
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
<b>第三學年 Third Year</b>							
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			
<b>第四學年 Fourth Year</b>							
體育選修	Physical Elective Course	1	2	0	1	2	0
<b>專業選修科目 Department Electives Courses</b>							
<b>第一學年 First Year</b>							
電力電子學	Fundamental of Power and Electronics	3	3	0			
潔淨能源應用概論	Introduction to Clean Energy Applications				3	3	0
<b>第二學年 Second Year</b>							
工程軟體應用及實習	Application and Practices of Engineering	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			
基礎冷凍實習	Fundamental of Refrigeration Practice	3	2	2			
基礎空調實習	Fundamental of Air Conditioning Practice				3	2	2
變頻空調實務(一)	Variable Frequency Air Conditioning Practices	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				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				3	0	3
流體機械	Fluid Machinery				3	3	0
●冷凍空調基礎裝修實務	Basic Installation and Maintenance of Refrigeration and Air Conditioning Practices				3	2	2
變頻空調實務(二)	Variable Frequency Air Conditioning Practices				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
<b>第三學年 Third Year</b>							
高等工程數學	Advanced Engineering Mathematics	3	3	0			
智慧變頻空調實務	Practice of Intelligent Frequency-Conversion Air	3	2	2			
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			
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			
電腦輔助機構設計	Computer Aided Mechanism 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
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
師徒實務專題(一)	Mentor-Apprentice Project study ( I )	3	0	3			
專題師徒實習(一)	Mentor-Apprentice Internship Course for Project(I)	3	0	3			
<b>第四學年 Fourth Year</b>							
工業安全	Industry Safety	3	3	0			
冷凍空調應用實務	Application Practice of Refrigeration and Air Conditioning	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			
單晶片應用及實習	Application and Practices of Single Chip Controller	3	2	2			
熱交換器設計	Heat Exchanger Design and Analysis	3	3	0			
無塵室技術	Cleanroom 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			
能源管理技術	Energy Management Technology	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			
低溫熱源發電技術	Low-temperature heat recovery and power generation technology				3	3	0
高階微處理器機電控制實務	High-tech Microprocessor in Electro-mechanical Control				3	3	0
通風工程	Ventilation Engineering				3	3	0
綠建築與照明節能	Energy Saving of Green Building and Lighting				3	3	0
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
特殊空調系統	Distinctive Air-Conditioning System				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 137 學分【必修 108 學分，選修至少 29 學分(須含本系專業選修至少 23 學分)】

Students should complete at least 137 credits before graduation, including 108 required credits, 29 elective credits (elective credits should have at least 23 credits from department elective courses).

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 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、應修習下列專業共同選修至少 2 門課程(5 選 2)：冷凍空調應用、冷凍空調工程規劃與管理、壓縮機設計實務、低溫熱源回收發電技術、高階微處理器機電控制實務。

The fourth year should complete the following department required courses and at least 2 elective courses (2 out of 5): Application Practice of Refrigeration and Air Conditioning、Planning and Management of Refrigeration and Air-Conditioning Engineering、Compressor Design Practice、Low-temperature heat recovery and power generation technology、High-tech Microprocessor in Electro-mechanical Control

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