

國立中正大學前瞻中心先進製造碩士學位學程 113 學年度第 2 學期教學大綱表

Syllabus

課程名稱：(中文) 工具機 PC NC 架構之 CNC 人機介面設計與應用 (英文) CNC Machine Tool Human Machine Interface Design and Application for PC NC Structure					開課單位	前瞻製造系統頂尖 研究中心 AIM-HI
					課程代碼	4456203
授課教師	高永洲	學分數	3	選修	開課年級	研究所(碩博) Master/PhD Students
全英文授課 EMI	☒ 是 ☐ 否					
先修科目或先備能力：CNC、CAD、機械設計、Microsoft Visual Studio C#、視窗程式設計等。 <u>Pre-requisites: CNC, CAD, Machine Design, Microsoft Visual Studio C#, Windows Programming, etc.</u> Overview: This course will introduce industrial CNC controller system structure and application principle, operation, human-machine interface (HMI) design tool and development methods, etc. Students can become familiar with industrial CNC controller value-adding system development technology through this course in learning CNC HMI technology and in realizing the Microsoft Visual Studio integrated development environment. Talent students will be cultivated for the precision machine tool industry. The students could learn network programming, HMI design, and development methodologies. Objectives: To cultivate students to be familiar with the design and development of industrial CNC value-adding systems, and also PC NC controller structures.						
Textbook	1. Handouts and other printed information will be posted to eCourse 2. 2. Papers related to HMI and CNC Controllers.					
教學要點概述						
教材編選 teaching materials	☒ 自製簡報(ppt) ☒ 課程講義 ☐ 自編教科書 ☐ 教學程式 ☒ 自製教學影片 ☒ 其他					
教學方法 teaching methods	☒ 講述 ☒ 小組討論 ☒ 學生口頭報告 ☐ 問題導向學習 ☐ 個案研究 ☒ 其他					
評量工具 Evaluation tools	☐ 期中考 ☐ 期末考 ☐ 隨堂測驗 ☒ 隨堂作業 ☒ 課後作業 ☒ 期中報告 ☒ 期末報告 ☐ 專題報告 ☐ 評量尺規 ☒ 其他					
教學資源 teaching resources	☒ 課程網站 ☒ 教材電子檔供下載 ☐ 實習網站					
教師相關訊息 instructor's information	Professor Yung-Chou Kao					
課程大綱 Syllabus			分配時數 Hours			可達成核心能力
單元主題	內容綱要	講授	示範	習作	其它	
Introduction	Introduction of Machine Tool Precision machinery	9				D1, D2, D4, D8
CNC structure	Industrial CNC PC NC structure	9				D1, D2, D4, D8
Human Machine Interface	Essentials of Colors and Beauty Basics on Human Machine Interface	9				D1, D2, D4, D8

Networking	Network Programming Networking with CNCs	3	3	9		D1, D2, D4, D8
Case Study	Industrial case study		3			D1, D2, D4, D5
Teamwork	Team-based Project Development and Implementation			9		D1, D2, D3, D4, D5, D8
可達成核心能力		核心能力達成指標				
D1	具機械與光機電整合工領域之專業知識	具備機械加工所使用之 CNC 工具機架構基本知識				
D2	策劃及執行機械及光機電整合工領域專題研究之能力	瞭解 CNC 工具機操作之人機介面並具備團隊合作規劃友善 CNC 人機介面之專業領域研究之能力				
D3	撰寫科技論文與簡報之能力	透過分組以團隊運作方式探討 PC NC 系統架構並整理與撰寫專題報告，培養專業論文之撰寫能力。				
D4	創新思考及獨立解決機械與光機電整合工程問題之能力	藉由團隊會議腦力激盪思考 CNC 創新人機介面並尋求可行之解決方案與完備解決機械加工之加值功能的能力。				
D5	跨領域人員協調整合之能力	經由團隊之運作培養與不同專業領域人員的溝通能力與協調合作統合能力。				
D8	終身自我學習成長之能力	透過學習國內外各式 CNC 控制器之架構培養主動學習態度建立終身自我學習成長之能力。				

研究所核心能力(請檢視)

D1 具機械與光機電整合工程領域之專業知識

D2 策劃及執行機械及光機電整合工程領域專題研究之能力

D3 撰寫科技論文與簡報之能力

D4 創新思考與獨立解決機械與光機電整合工程問題之能力

D5 跨領域人員協調整合之能力

D6 良好的國際觀

D7 具備團隊合作精神及領導、管理、規劃、溝通之能力

D8 終身自我學習成長之能力

D9 瞭解工程倫理、社會責任與永續發展之重要性

Notes:				
Class Time	Classroom	Scoring	Office hour	Evaluation
Monday 14:10~17:00	Innovation Building 202	Homework and quiz 30% Interactivity & Attendance 10% Personal report 30% The team reports 30%	Wednesday 09:30~11:30 Room: 531A Tel: 2720411 # 33307 E-mail: imeyckao@ccu.edu.tw	A questionnaire is used to investigate the lecturing and student learning outcomes
Weeks	Course Outlines			Remarks
1	Introduction of precision machinery			
2	Introduction of industrial CNC such as A-LNC, SYNTEC, DELTA, FANUC, etc.			HW#1
3	Introduction of CNC operating system			
4	Introduction of CNC framework and principle			HW#2
5	Team project starts			Understand industrial CNC Operation practice
6	Introduction of HMI applications			Colors, principles of beauty, etc.

7	Introduction of HMI design tools - iHMI	Microsoft Visual Studio OOP HW#3
8	Introduction of HMI design tools – CNCs in general	HMI layouts
9	Mid-term exam and/or report	Personal report
10	Practices on HMI – CNCs such as Syntec	Visual Studio C#
11	Practices on HMI – CNCs such as Fanuc	HW#4
12	Introduction of networked applications - CNCs	
13	Introduction of tools – CNCs, in general	HW#5
14	Term project design, development, and implementation	HMI design and development
15	Term project design, development, and implementation	HW#6
16	Term project design, development, and implementation	HMI design and development
17	Term project design, development, and implementation	HMI design and development
18	Term project report, presentation, and submission	Team-based final report
Others: 本課程以全英文授課。English is the official language in this course		