國立勤益科技大學
National Chin-Yi University of Technology

115 學年度 1 學期課程大綱

Year of 115-1 Syllabus

部別 Department	■日間部 Regular Day School □進修部 Division of Countinuing Education	學制 School System	□博士 Doctoral Degree ■碩士 Master's Degree □四技 Bachelor's Degree (4-year College) □二技 Bachelor's Degree (2-year College) □二專 Associate Degree (2-year program)
授課教師 Instructor(s)	魏銘彥	開課代碼 Course Code	G708
科目名稱 Course Name	DSP 於驅動器應用專論 Advanced Topics in DSP Drivers	必/選修 Required/Elective	□必修 Required ■選修 Elective
開課年級 Grade	碩士班一、二年級 Master's first and second year	開課學期 Semester	■上 Fall □下 Spring
開課單位 Course Department	電機工程系	學分/學時數 Credit/Hours	3 / 3
全程外語授課 Foreign language Teaching entirely	□是 Yes ■否 No	主要授課語言 Main language	英語 English
先修課程 Prerequisite course(s)	電機控制		
優質課程類別 Course attributes (可複選)	■一般課程 General Courses □智慧財產權 Intellectual Property □內涵式服務學習課程 Service Learning □性別平等 Gender Equality □綠色課程 Green Technology□創新創意課程 Innovation □工作（職場）倫理課程 Career Ethics □工具機技術研發 Tool Machine Technology Development 創新、創意課程定義：課程目標為「激發學生獨特的想像與創意思考，透過企劃與執行以創新模式解決實際問題。 Definition of Innovation and Creative courses: the objectives of the course aim to stimulate students' imagination and creative thinking skills, and to solve practical problems with innovative modes through planning and implementing different tasks.		
課程與校核心能力關聯 Core competence (可複選，至多選4項)	□表達溝通能力 Communication and Presentation Skill □創意創新能力 Innovation Skill □關懷服務能力 Community Care and Service Skill □思考推理能力 Thinking and Reasoning Skill ■專業實務能力 Professional Practice Skill □宏觀視野能力 Macro Skill		
教科書 Textbook	自編		
參考書目 Other References			
課程目標 Course objectives	本課程旨在介紹數位訊號處理器（DSP）於電動機驅動系統之應用技術，使學生具備 DSP 程式開發、系統建模與控制設計之能力。課程內容涵蓋 DSP 程式語法、系統時脈與中斷機制、A/D 與 D/A 轉換器應用、電動機動態模型建立、座標軸轉換、感測器介接、開迴路與閉迴路控制原理，以及電流、速度與位置控制迴路設計。透過理論講授與實作練習，使學生能整合硬體與軟體設計技術，完成電動機驅動系統之分析、設計與控制，培養智慧機電系統與工業自動化應用之專業能力。		

	This course introduces the application of Digital Signal Processors (DSPs) in motor drive systems and equips students with the fundamental knowledge and skills required for DSP programming, system modeling, and control design. Topics include DSP programming syntax, system clock configuration, interrupt handling, analog-to-digital (A/D) and digital-to-analog (D/A) conversion, dynamic modeling of electric motors, coordinate transformations, sensor interfacing, open-loop and closed-loop control principles, and the design of current, speed, and position control loops. Through a combination of lectures and hands-on laboratory exercises, students will develop the ability to integrate hardware and software technologies for the analysis, design, and control of motor drive systems, preparing them for applications in intelligent mechatronic systems and industrial automation.
評量方式 Evaluation	出席 Attendance (10) 作業 Assignments (20) 平時考 Quizzes/Tests ( ) 期中考 Midterm Exam (30) 期末考 Final Exam (40) 其他:(請敘述非筆試之評量方式) Other (please explain the evaluation methods if there are no written exams):
內容綱要 Course Outline	本課程介紹數位訊號處理器（DSP）於電動機驅動系統之應用技術，內容涵蓋 DSP 程式設計、系統建模、系統時脈與初始化設定、中斷程式設計、A/D 與 D/A 轉換器應用、電動機動態模型、座標軸轉換、控制器設計、感測器介接、開迴路與閉迴路控制，以及電流、速度與位置控制迴路設計。課程學習驅動器架構與規劃，培養學生具備電動機驅動系統分析、設計與控制之能力。 This course introduces the application of DSPs in electric motor drive systems. Topics include DSP programming, system modeling, system clock configuration and initialization, interrupt programming, A/D and D/A converter applications, dynamic modeling of electric motors, coordinate transformations, controller design, sensor interfacing, open-loop and closed-loop control, and the design of current, speed, and position control loops. The course also covers drive system architecture and planning, enabling students to develop the knowledge and skills required for the analysis, design, and control of electric motor drive systems.
自編教材 Self-compiled textbook (非自編教材請填寫原因)	■是 Yes □否 No,原因 Reason(s):
符合智財規範 Compliance with Intellectual property (不符合智財規範請填寫原因)	□是 Yes ■否 No,原因 Reason(s):
備註 Note	

教學進度 Course schedule		
週次 Week	教學與作業進度 Teaching Schedule/Assignments	備註 Note
1	課前介紹(Course Introduction)	
2	程式語法學習與模型建立(Programming Syntax and System Modeling)	
3	系統時脈與初始設計(System Clock Configuration and Initialization Design)	
4	電動機動態模型設計(Dynamic Modeling of Electric Motors)	
5	數位訊號處理中斷程式與應用(DSP Interrupt Programming and Applications)	
6	類比數位轉換器與數位類比轉換器(A/D and D/A Converters)	
7	座標軸轉換設計(Coordinate Transformation Design)	
8	控制器設計(Controller Design)	

9	期中考(Midterm Exam)	
10	感測器介紹(Introduction to Sensors)	
11	開迴路控制(Open-Loop Control)	
12	閉迴路控制(Closed-Loop Control)	
13	硬體設計(Hardware Design)	
14	硬體設計(Hardware Design)	
15	電流迴路控制系統設計(Current Loop Control System Design)	
16	速度迴路控制迴路設計(Speed Loop Control Design)	
17	角度迴路控制系統設計(Angle Loop Control System Design)	
18	期末考(Final Exam)	

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