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②图 i 東華大學 教學計劃表 Syllabus

		4. = 4	1 =110	J					
	稱(中文) e in Chinese	自動控制系統A	I		學年/學期 Academic Year/Sem	113/1			
	稱(英文) e in English	Automatic Control Systems							
	目代碼 se Code	EE_3360AA	電	電機工程學系					
	多別 `ype	學程 Program 學分數/時間 Credit(s)/Hour(s) 3.0/3.0							
	课教師 ructor	/蘇仲鵬							
	多課程 equisite								
		課	程描述 Course De	escrip	tion				
講授 自動控制系統的重要觀念及相關理論,使同學能具備回授控制系統的特性分析、控制器設計、與系統模擬的能力,使應用於包括馬達驅動控制、多軸機器臂運動控制等重要領域。課程內容包括連續時間系統的物理數學模型建立、穩定性分析、動態響應、根軌跡方法、PID控制器設計、頻率響應分析,相位領先、與相位滯後的設計,並介紹系統狀態空間模型與狀態回授的概念與方法。									
課程目標 Course Objectives									
學習控制系統之穩定度分析、控制器設計方式、以及控制相關軟硬體設備之認識與應用									
系專業能力 Basic Learning Outcomes						Cor	課程目標與系專業能 力相關性 Correlation between Course Objectives and Dept.'s Education Objectives		
			知識之基本能力。To		ate the basic		•		
knowledge of engineering, applied mathematics and physics 培育系統分析、模擬驗證、實作實現之能力。To cultivate the basic ability of analysis,							•		
verification and implementation of systems. c 訓練軟體工具使用與硬體實務驗證相互輔助之能力。To train the auxiliary ability between the utilization of software tool and the verification of the hardware practice						:	0		
1)	訓練雷機本知學能技術與工程實務相互結合運用之能力。To train the integrate ability								
E 落實專品	落實專題製作之群體合作與團隊競爭之能力。To fulfill the ability of group cooperation								
and teamwork competition. A							•		
了解學術倫理與智慧財產觀念,掌握產業更迭需求與具備多元專長之能力。To obtain the ability of multi-specialization and to meet the industry demand as well as to have the ability of academic ethics and concept of intellectual property						0			
T解國內外市場變化,具備基本科技英文閱讀溝通之能力。To understand the change of global market and the have the basic ability of reading and conversation in English.							\circ		
圖示說明Illustration : ● 高度相關 Highly correlated ○中度相關 Moderately correlated									
授課進度表 Teaching Schedule & Content									
週次Week		內容	Subject/Topics	備註Remarks					

1

控制系統介紹、Laplace transform

2	Transfer Function • Mathematical Models • Block Diagram						
3	Transfer Function · Mathematical Models · Block Diagram						
4	Stability and Dynamic Response						
5	Stability and Dynamic Response						
6	The Root Locus Method						
7	Steady-State Error Effect of Disturbance						
8	Plant Parameter Uncertainty Effect of Measurement Noise Control Constraints						
9	期中考試週 Midterm Exam						
10	Time-Domain Design - Design Specifications, Design by Gain Adjustment						
11	Design by Cascade Compensation Lead and PD Controller Lag and PI Controller, Lead-Lag and PID Controller Tuning PID Controllers and Anti-Windup Schemes						
12	Frequency Response Methods Bode Plots						
13	Frequency Response Methods Nyquist Criterion Relative Stability Relations between Frequency-Domain and Time-Domain Responses						
14	Frequency-Domain Design Design Specifications Design by Gain Adjustment						
15	Lead Compensation Lag Compensation PI Compensation Lead-Lag Compensation Advantages of the Frequency-Domain Approach						
16	State-Space Models Solution of the State Equations						
17	Transfer Function of a State-Space Model State-Space Model of a Transfer Function						
18	期末考試週 Final Exam						

教學策略 Teaching Strategies						
✓ 課堂講授 Lecture						
教學創新自評Teaching Self-Evaluation						
創新教學(Innovative Teaching)						
問題導向學習(PBL) 團體合作學習(TBL) 解決導向學習(SBL)						
翻轉教室 Flipped Classroom 磨課師 Moocs						
社會責任(Social Responsibility)						
□ 在地實踐Community Practice □ 產學合作 Industy-Academia Cooperation						
跨域合作(Transdisciplinary Projects)						
□ 跨界教學Transdisciplinary Teaching □ 跨院系教學Inter-collegiate Teaching						
□ 業師合授 Courses Co-taught with Industry Practitioners						
其它 other:						

學期成績計算及多元評量方式 Grading & Assessments									
配分項目	配分比例 Percentage	多元評量方式 Assessments							
Items		測驗 會考	實作 觀察	口頭 發表	專題 研究	創作 展演	卷宗 評量	證照 檢定	其他
平時成績(含出缺席) General Performance (Attendance Record)	10%		~						
期中考成績 Midterm Exam	30%					~			
期末考成績 Final Exam	30%	>							
作業成績 Homework and/or Assignments	30%	~							
其他 Miscellaneous (Matlab 程式)	10%								

評量方式補充說明

Grading & Assessments Supplemental instructions

教科書與參考書目(書名、作者、書局、代理商、說明)

Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)

(1) Hassan K. Khalil

Control Systems: An Introduction, Michigan Publishing, 2023

(2) Norman S. Nise,

Control Systems Engineering

8th Ed., John Wiley & Sons, 2017.

(滄海圖書代理)

課程教材網址(含線上教學資訊,教師個人網址請列位於本校內之網址)

Teaching Aids & Teacher's Website(Including online teaching information.

Personal website can be listed here.)

東華大學e-學院

其他補充說明(Supplemental instructions)