

國立中正大學機械工程學系 110 學年度第二學期教學大綱表

課程名稱：(中文) 系統識別 (英文) System Identification					開課單位	機械系		
					課程代碼	4205759		
授課教師	姚賀騰	學分數	3	選修	開課年級	碩一		
先修科目或先備能力：線性系統								
課程概述：本科目將介紹各種系統識別的方法，包含參數模型法與非參數模型法，頻譜法與狀態空間法，透過各種不同的方法來了解如何針對不同的系統進行參數鑑別，並教導學生如何驗證系統之正確性								
目標：讓學生了解在實際工程問題中，如何透過訊號的擷取與處理以得到系統模型，此一模型可以用來幫助控制器設計與參數設計								
教科書	System Identification, theory for the user, L. Ljung, Prentice Hall, ,1999							
課程大綱			分配時數				課程目標	
單元主題	內容綱要		講授	示範	習作	其他 ¹	教育目標	核心能力
Introduction to system identification problem	System representation Signal and system		8		1		<u>1,2,3,</u>	<u>D1, D2, D4</u>
Least square estimate method	Least square approach and recursive least square method		5		1		<u>1,2,3</u>	<u>D1, D2, D4</u>
Non-parametric method	Transient, spectral, correlation and frequency methods		8		1		<u>1,2,3</u>	<u>D1, D2, D4</u>
parametric method	FIR ARX, ARMAX, Box-Junkin models		13		2		<u>1,2,3,</u>	<u>D1, D2, D4</u>
State Space method	ERA and subspace methods		8		1		<u>1,2,3,</u>	<u>D1, D2, D4</u>

教學要點概述：			
上課時間	依相關公告	上課地點	依相關公告
評量方式	Quiz: 20% Midterm: 30% Final: 30% Homework: 20%	Office hour	一：1:00-4:00pm
週次	教 學 與 作 業 進 度		備 註
1	Introduction to continuous system representation method (time domain)		
2	Introduction to continuous system representation method (frequency domain)		
3	Persistent excitation (Pseudo Random Binary Signal, PRBS)		
4	Last square method		
5	Recursive least square method		
6	Transient response method, Stochastic and random signal		
7	Correlation method		
8	Frequency response method and ETFE method		
9	Midterm		
10	Parametric method for FIR and ARX models (I)		
11	Parametric method for ARMAX and ARARX models		
12	Parametric method for Box-Junkin model		
13	Kalman filter method		
14	Maximum likelihood method		
15	Model reduction		
16	State space (ERA) method		
17	State space (subspace) method		
18	Final exam		
參考書目：System Identification, T. Soderstrom and P. Stoica, Prentice Hall, 1989. System Modeling and Identification, R. Johansson, Prentice Hall, 1993 Applied System Identification, J. N. Juang, Prentice Hall, 1994 Susbspace Identification for Linear Systems, Theory - Implementation-Applications, P. Van Overschee B. De Moor, 1996, Kluwer Academic Publishers			

