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②國玄東華大學

教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	時間序列AB			學年/學期 Academic Year/Se	114/1		
課程名稱(英文) Course Name in English	Time Series						
科目代碼 Course Code	AM3260AB	系級 Department 學三 & Year		開課單位 Course-Offering Department	應用數學系		
修別 Type	學程 Program	學分數/時 Credit(s)/Hou		3.0/3.0			
授課教師 Instructor	/黄灝勻						
先修課程 Prerequisite	/#統計學						

課程描述 Course Description

This course delves into the fundamental principles and advanced techniques of time series analysis, aiming to equip students with the ability to analyze, forecast, and interpret time series data. By combining theoretical learning with practical application, students will gain a comprehensive understanding of time series analytical methods. The course integrates theoretical lectures with case study analyses, aiming to enhance students' critical thinking abilities and problem-solving skills. It is suitable for students or professionals in the fields of statistics, economics, and finance. Through this course, students will be able to independently conduct analysis and forecasting of time series data and apply the knowledge in various practical applications.

課程目標 Course Objectives

介紹時間序列統計分析方法及相關應用

Introduction of the linear time series models and their applications to the modeling and prediction of data collected sequentially in time.

		課程目標與系專業能
		力相關性
	糸專業能力	Correlation between
		Course Objectives
	Basic Learning Outcomes	and Dept.'s
		Education
		Objectives
A	具備基本數學知識及邏輯推理能力。Have well-founded background in mathematics and be capable of logical reasoning.	•
В	具備學習數學相關領域的預備知識。Be knowledgeable about fields related to mathematics.	•
	具備軟體應用與科學計算能力。	
C	Be able to use mathematics software and scientific computation skill in problem-	
	solving.	

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	Introduction	
2	Autocorrelation and Partial Autocorrelation Functions	
3	Autocorrelation and Partial Autocorrelation Functions Estimation in Stationary Time Series	
4	Holiday	

5	Holiday						
6	Estimation in Stationary Time Series (Autoregressive Moving Average Model) Parameter Estimation and Central Limit Theorem for AR(p) Model						
	Parameter Estimation and Central Limit Theorem for AK(p) Model Nonstationary process						
7	Autoregressive-integrated Moving Average Model (ARIMA) Seasoanl ARMA Models						
8	Autoregressive Conditionally Heteroscedastic Model Threshold Models, Vector ARIMAX						
9	期中考試週 Midterm Exam						
10	Midterm Exam Review						
11	State Space Models (I)						
12	State Space Models (II)						
13	State Space Models (III)						
14	Other topics: Recurrent Neural Network Model						
15	Other topics: Long Short-Term Memory						
16	Presentation						
17	期末考試週 Final Exam						
18							
	教學策略 Teaching Strategies						
課堂講	授 Lecture						
其他Mis	scellaneous:						
	教學創新自評 Teaching Self-Evaluation						
創新教學(Innovative Teaching)						
問題導	向學習(PBL)						
翻轉教	室 Flipped Classroom						
社會責任(Social Responsibility)						
■ 在地實踐Community Practice ■ 産學合作 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 othe	r:						

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)									
期中考成績 Midterm Exam	40%	~							
期末考成績 Final Exam	60%		~		~				
作業成績 Homework and/or Assignments									
其他 Miscellaneous									

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.)

Analysis of Financial Time Series, by Ruey S. Tsay Publisher: Wiley Time Series Analysis: Univariate and Multivariate Methods Author: William W.S. Wei Publisher: Pearson Addison Wesley Reference: The Econometrics of Financial Markets, by Campbell, Lo and MacKinlay Publisher: Princeton University Press Time Series Analysis, by James D. Hamilton Publisher: Princeton University Press Time Series: Theory and Methods, 2nd ed., by Brockwell and Davis Publisher: Springer-Verlag Time Series Analysis and Its Applications: with R examples Authors: R. H. Shumway and D. S. Stoffer Publisher: Springer

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.)

其他補充說明(Supplemental instructions)