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②图玄東華大學

教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	資料科學			學年/學期 Academic Year/Se	112/1		
課程名稱(英文) Course Name in English	Data Science						
科目代碼 Course Code	ECM5700	系級 Department 碩士 (& Year		開課單位 Course-Offering Department		經濟學系	
修別 Type	選修 Elective	學分數/時 Credit(s)/Hou		3.0/3.0			
授課教師 Instructor	/李同龢						
先修課程 Prerequisite							
and the base of the state of th							

課程描述 Course Description

Data Science is the study of the generalizable extraction of knowledge from data. Data scientist use those studies to make predictions and find insights from the data. In this class R is the primary tool to do the analytical works. I will introduce various methods in three major areas which are data manipulation, visualization and fundamental statistical learning.

課程目標 Course Objectives

- 1 · Manipulating data for analysis
- 2 · Visualizing data for analytical purpose
- 3 · Utilizing different statistical tools to analyze data

	系專業能力 Basic Learning Outcomes	課程目標與系專業能 力相關性 Correlation between Course Objectives and Dept.'s Education Objectives
A	數理分析能力:通曉經濟學的進階理論技巧,應用數學與賽局解決經濟議題的能力。 Mathematical analysis skills: Mastering in intermediate application of mathematical theories and game theory in analyzing economic issues.	•
В	實證經濟分析能力:通曉經濟學的進階實證技巧,善用資訊科技進行資訊蒐集、資料統計與計量分析。Empirical analysis skills: Mastering in intermediate application of statistics and econometrics in data collection and examination.	•
С	微觀經濟之闡釋能力:通曉進階個體經濟學相關的理論與應用。Microeconomic perspective: Thorough understanding of intermediate microeconomic theories and relevant application.	0
D	宏觀經濟之闡釋能力:通曉進階總體經濟學相關的理論與應用。Macroeconomic perspective: Thorough understanding of intermediate macroeconomic theories and relevant application.	
Е	自我調整適應社會之能力:具備適應現代社會的學養以及就業能力。Employment opportunities: capabilities of working on important policy and decision challenges in business and government	
F	溝通表達能力:思路清晰,有能力與人溝通並撰寫進階專業研究報告。Communication skills: Having a clear mind and capability in writing an intermediate professional academic report.	0
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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	R Basic			
3	Data wrangling			
4	Graphics and Statistical learning, ISL, Ch. 2			
5	No class, national holiday			
6	Linear regression, ISL, Ch. 3			
7	Classification, ISL, Ch. 4			
8	Resampling methods, ISL, Ch. 5			
9	Midterm project presentation			
10	Linear model selection and regularization, ISL, Ch. 6			
11	Moving beyond linearity, ISL, Ch. 7			
12	Tree-based methods, ISL, Ch. 8			
13	Support vector machine, ISL, Ch. 9			
14	Unsupervised learning, ISL, Ch. 10			
15	Association analysis			
16	Neural networks and deep learning			
17	no class, New Year Day			
18	Final exam and project presentation			
	教學策略 Teaching Strategies			
✓ 課堂講	授 Lecture	Field Trip		
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) 團體合作學習(TBL) 解決導向學	로컬(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 Cooperati	on		
跨域合作(Transdisciplinary Projects)			
	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 多元評量方式 Assessments								
Items	Percentage	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 General Performance	20%		~						
期中考成績 Midterm Exam									
期末考成績 Final Exam									
作業成績 Homework and/or Assignments	40%		~						
其他 Miscellaneous (Project)	40%		~		~				

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、説明)

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

Recommended Textbook: Introduction to Statistical Learning (ISL), James, Witten, Hastie and Tibshirani, 2017.

R for Data Science, Grolemund and Wickham, r4ds.had.co.nz

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)