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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	資料科學			學年/學期 Academic Year/Se	111/1		
課程名稱(英文) Course Name in English	Data Science						
科目代碼 Course Code	ECD0060	系級 Department 博士 & Year		開課單位 Course-Offering Department	Course-Offering		
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							

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 anlaysis
- 2 · Visualizing data for analytical purpose
- 3 · Utilizing different tools to analyze data

	条專業能力 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:通曉經濟學的高階理論技巧,應用數學與賽局解決經濟議題的能力Mathematical analysis skills: Mastering in advanced application of mathematical theories and game theory in analyzing economic issues	•
В	實證經濟分析能力:通曉經濟學的高階實證技巧,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 advanced application of statistics and econometrics in data collection and examination	•
С	微觀經濟之闡釋能力:通曉高階個體經濟學相關的理論與應用Microeconomic perspective: Thorough understanding of advanced microeconomic theories and relevant application	0
D	宏觀經濟之闡釋能力:通曉高階總體經濟學相關的理論與應用Macroeconomic perspective: Thorough understanding of advanced macroeconomic theories and relevant application	
Е	樂活能力:具備適應現代社會的高階學養以及就業能力Employment opportunities: Capabilities of advanced 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高階專業研究報告Communication skills: Having a clear mind and profound ability in presenting advanced professional academic research	0

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	No class, national holiday	
5	Graphics and Statistical learning, ISL, Ch. 2	
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	Text mining	
18	Project presentation	
	教學策略 Teaching Strategies	
✓ 課堂講	舞授 Lecture)
其他Mi	iscellaneous:	
	教學創新自評Teaching Self-Evaluation	
創新教學((Innovative Teaching)	
問題導	事向學習(PBL) 團體合作學習(TBL) 解決導向學習(SBL)	
翻轉教	文室 Flipped Classroom	
社會責任((Social Responsibility)	
	實踐Community Practice 產學合作 Industy-Academia Cooperation	
跨域合作((Transdisciplinary Projects)	
	文學Transdisciplinary Teaching	
業師合	分授 Courses Co-taught with Industry Practitioners	
其它 othe		
	er:	

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(含出缺席) General Performance (Attendance Record)	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、說明)

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)

 $\label{thm:condition} \mbox{Teaching Aids \& Teacher's Website} (\mbox{Including online teaching information.}$

Personal website can be listed here.)

Online class, if any.

https://meet.google.com/wxm-xmtn-yqj

其他補充說明(Supplemental instructions)