

國立東華大學
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/Semester	111/1
課程名稱(英文) Course Name in English	Data Science				
科目代碼 Course Code	EC__M5700	系級 Department & Year	碩士	開課單位 Course-Offering Department	經濟學系
修別 Type	選修 Elective	學分數/時間 Credit(s)/Hour(s)		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 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.				●
B	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.				●
C	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.				○
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.				
E	樂活能力：具備適應現代社會的進階學養以及就業能力。Employment opportunities: Capabilities of intermediate 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.				○
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

- ☒ 課堂講授 Lecture
 ☐ 分組討論 Group Discussion
 ☐ 參觀實習 Field Trip
☐ 其他 Miscellaneous:

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 Industry-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 Items	配分比例 Percentage	多元評量方式 Assessments							
		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、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, Grolemond 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.) Online class, if any. google meet: https://meet.google.com/ydv-bqnu-bex									
其他補充說明 (Supplemental instructions)									