

國立東華大學
教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	應用統計線性模型AA			學年/學期 Academic Year/Semester	114/1
課程名稱(英文) Course Name in English	Applied Statistical Linear Models				
科目代碼 Course Code	AM__5150AA	系級 Department & Year	碩士	開課單位 Course-Offering Department	應用數學系
修別 Type	選修 Elective	學分數/時間 Credit(s)/Hour(s)		3.0/3.0	
授課教師 Instructor	/楊宏基				
先修課程 Prerequisite					
課程描述 Course Description					
線性模型為統計推論與資料科學的重要核心工具。本課程將系統性講解線性迴歸與廣義線性模型之推導、應用與限制，並涵蓋模型建立、假設檢定、變數選取、模型診斷及實務案例分析。課程同時結合理論與實作，培養學生於不同研究領域中正確應用統計模型的能力。					
課程目標 Course Objectives					
Applied linear models for regression, analysis of variance and experimental design are widely used in various application domains. Starting with the simple linear models, we will cover the main topics in linear statistical models such as multiple linear regressions, ANOVA, logistic regression, etc. Students will be exposed to both theoretical and practical aspects of applied linear models. Selected topics such as statistical machine learning, variable selection and PCA will also be briefly addressed if time permits.					
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	具備專業機率、統計知識與應用分析能力。Have well-founded expertise in probability and statistics, and good analytical ability in solving real problems.				●
B	具備程式設計與統計計算能力。Have the computer programming and statistical computing skills.				○
C	具備學習其它學科的能力，以期能邁向跨領域研究。Be able to study other fields of science so as to conduct interdisciplinary research in the future.				○
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	Course Introduction & Overview of Linear Models				
2	Simple Linear Regression and Inferences in Regression and Correlation Analysis				
3	Diagnostics and Remedial Measures				
4	No Class				
5	No Class				
6	Simultaneous Inferences and Other Topics in Regression Analysis				

7	Multiple Regression I	
8	Multiple Regression II	
9	期中考試週 Midterm Exam	
10	Regression Models for Quantitative and Qualitative Predictors	
11	Building the Regression Model I: Model Selection and Validation	
12	Building the Regression Model II: Diagnostics	
13	Building the Regression Model III: Remedial Measures	
14	Autocorrelation in Time Series Data	
15	Introduction to Nonlinear Regression and Neural Networks	
16	Logistic Regression, Poisson Regression, and Generalized Linear Models	
17	期末考試週 Final Exam	
18		

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(含出席) General Performance (Attendance Record)	25%								
期中考成績 Midterm Exam	25%								
期末考成績 Final Exam	25%								
作業成績 Homework and/or Assignments	25%								
其他 Miscellaneous (_____)									
評量方式補充說明 Grading & Assessments Supplemental instructions									
Homework (25%) - Weekly/bi-weekly assignments combining theory and R applications, with short reports to reinforce lecture content. Midterm Exam (25%) - Covers Weeks 1-8; theory, computations, and interpretation of results. Final Exam (25%) - Comprehensive, with emphasis on later topics (model diagnostics, ANOVA/ANCOVA). General Performance (25%) - Class participation, in-class exercises.									
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.)									
Kutner, M. H., Nachtsheim, C. J., Neter, J., & Li, W. (2005). Applied Linear Statistical Models (5th ed.). New York: McGraw-Hill/Irwin. ISBN 0-07-238688-6.									
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)									