


國立東華大學
教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	應用隨機過程			學年/學期 Academic Year/Semester	114/1
課程名稱(英文) Course Name in English	Applied Stochastic Processes				
科目代碼 Course Code	AM_50800	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	/謝思民				
先修課程 Prerequisite					
課程描述 Course Description					
Discrete and continuous time Markov chains, including Poisson process, birth and death process as special cases.					
課程目標 Course Objectives					
此為應用機率模型的後續課程 介紹較為深入的隨機過程模式 A continuation of applied probability models. Selected topics on stochastic processes.					
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	Discrete time Markov chains. Definitions and basic properties.				
2	Examples. Class structure.				
3	Hitting times and absorption probabilities.				
4	Strong Markov property. Recurrence and transience, random walks.				
5	Invariant distributions.				
6	Convergence to equilibrium.				
7	Time reversal.				
8	Ergodic theorem.				

9	期中考試週 Midterm Exam	
10	Exponential races.	
11	Poisson process.	
12	Poisson process.	
13	Birth process. Birth and death process.	
14	Jump chain and holding times.	
15	Forward and backward equations.	
16	Class structure. Hitting times and absorption probabilities. Recurrence and transience.	
17	Invariant distributions. Convergence to equilibrium. Time reversal. Ergodic theorem.	
18	期末考試週 Final Exam	

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									
期中考成績 Midterm Exam	20%								
期末考成績 Final Exam	30%								
作業成績 Homework and/or Assignments	50%								
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.)									
Main references: 1. "Markov chains" by J.R.Norris, Cambridge University Press. 2. "Stochastic processes" by S.M.Ross, John Wiley & Sons 3. "Introduction to probability models" by S.M.Ross, Academic Press. 4. 'A first course in stochastic processes" by S.Karlin and H.M.Taylor, Academic Press.									
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)									