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②國玄東華大學

教學計劃表 Syllabus

教子可宣化 Oyliabuo							
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	AM74100	系級 Department 博士 & Year		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.

		課程目標與系專業能 力相關性
	系專業能力 	Correlation between Course Objectives
	Basic Learning Outcomes	and Dept.'s Education
		Objectives
A	具備專業知識及邏輯推理能力。Have well-founded expertise and be capable of logical reasoning.	•
В	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.	•
С	具備獨立思考與解決問題的能力。 Be capable of independent thinking and have the problem-solving skills.	•

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					
其他Mis	scellaneous:					
	教學創新自評 Teaching Self-Evaluation					
創新教學()	Innovative Teaching)					
問題導向	向學習(PBL) ■ 團體合作學習(TBL) 解決導向學習(SBL)					
翻轉教室 Flipped Classroom						
社會責任(Social Responsibility)						
在地實踐Community Practice						
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	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(含出缺席) General Performance (Attendance Record)									
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)