



課 綱 Course Outline
應用數學系博士班

中文課程名稱 Course Name in Chinese	機率專論(一)				
英文課程名稱 Course Name in English	Topics in Probability (I)				
科目代碼 Course Code	AM_73200	班 別 Degree	博士班 Ph. D.		
修別 Type	選修 Elective	學分數 Credit(s)	3.0	時 數 Hour(s)	3.0
先修課程 Prerequisite	高等機率論、隨機過程。				
課程目標 Course Objectives					
This course is an introduction to stochastic inequalities and comparison methods for establishing the inequality. My goal is to develop students' intuition, which, hopefully, will enable students to think inequality probabilistically.					
系教育目標 Dept.'s Education Objectives					
1	訓練嚴謹思考與推理能力。 To provide a solid training in rigorous thinking and reasoning ability.				
2	奠定理論與應用數學的基礎知識。 To establish well-founded background knowledge in pure and applied mathematics.				
3	具備跨領域學習能力。 To prepare the students for interdisciplinary study in the future.				
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	具備專業知識及邏輯推理能力 Have well-founded expertise and be capable of logical reasoning.			●	
B	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.			●	
C	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

課程大綱
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We will start with two popular orderings between random variables: stochastic ordering and variability ordering. We then talk about an important inequality concept between life distributions that is based on notions of aging. These inequalities and orderings will also be extended carefully to random vectors.

In the second part of the course, we move to introduce a few common comparison methods for establishing stochastic inequalities between stochastic models. Those include functional method, mapping method and sample-path method. If time is allowed, we will further introduce another useful comparison tool, the coupling method, which plays a crucial role in modern applied probability.

資源需求評估 (師資專長之聘任、儀器設備的配合 . . . 等)

Resources Required (e.g. qualifications and expertise, instrument and equipment, etc.)

本系專、兼任教師，相關硬軟體。

課程要求和教學方式之建議
Course Requirements and Suggested Teaching Methods

講授、習題

其他
Miscellaneous

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