



課 綱 Course Outline

應用數學系博士班

中文課程名稱 Course Name in Chinese	應數專論(一)				
英文課程名稱 Course Name in English	Topics in Applied Mathematics (I)				
科目代碼 Course Code	AM_70000	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	無				
課程目標 Course Objectives					
<p>此課程主要介紹二次偏微分方程的一些主要的性質，而二次偏微分方程中我們選擇最有代表性的三類型為：Laplace equation, Heat equation, and Wave equation.</p> <p>In this course we introduce properties of second order partial differential equations and discuss the important three classes of them: Laplace equations, Heat equations, and Wave equations.</p>					
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 Course Outline		
1. 簡介 Introduction. 2. 傳導方程式 Transport equation. 3. Laplace 方程式 (Green 等式) The Laplace equation (Green' s Identity). 4. 基本解 Fundamental solution. 5. Poisson 方程式 Poisson equation. 6. 最大值原則 Maximum principle. 7. Green 函數 Greens function. 8. Perron 方法 Perron' s Method. 9. Poincare 不等式 Poincare inequality. 10. 波動方程式 Wave equation. 11. 熱傳導方程式 Heat equation.		
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.)		
本系相關專任教師。 Professors in related fields		
課程要求和教學方式之建議 Course Requirements and Suggested Teaching Methods		
課堂講授、習題、考試。 Lectures, homeworks, tests		
其他 Miscellaneous		
撰寫人：應用數學系 黃顯棟 撰寫人：100年4月		