



## 課 綱 Course Outline

### 應用數學系統計科學組

中文課程名稱 Course Name in Chinese	迴歸分析				
英文課程名稱 Course Name in English	Regression Analysis				
科目代碼 Course Code	AM_40300	班 別 Degree	學士班 Bachelor's		
修別 Type	學程 Program	學分數 Credit(s)	3.0	時 數 Hour(s)	3.0
先修課程 Prerequisite	基礎機率、統計學（或經任課教師同意）。已修數理統計學（一）者佳。				
課程目標 Course Objectives					

迴歸分析在應用領域中具有極重要的地位。本課程由簡單線性模式出發，探討Multiple Linear Regression, ANOVA, ANCOVA, Mixed Model 及實驗設計。透過理論的探討及資料分析，建立統計理論及實際操作的基礎。

Regression is one of the most widely used statistical methods in application. We will cover simple linear regression, multiple regression, ANCOVA and (if time permits) mixed model. Through discussion and lectures on theoretical, data-analysis aspects of regression, we will lay good foundation for future advancement.

#### 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
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A	具備基本數學知識及邏輯推理能力。 Have well-founded background in mathematics and be capable of logical reasoning.	●
B	具備機率、統計及相關領域的知識與應用能力。 Have the knowledge of probability and statistics and the related field, and the corresponding application ability.	●

C	具備軟體應用與統計計算能力。 Be able to use computer software for statistical computation in real applications.	●
圖示說明 Illustration : ● 高度相關 Highly correlated ○中度相關 Moderately correlated		
課程大綱 Course Outline		
<p>1. Simple linear regression: Inferences, diagnosis and remedial measures, connection with simultaneous estimation under normality。</p> <p>2. Multiple Linear Regression: Matrix representation、Gauss-Markov Theorem、Model Building and Variable Selection。</p> <p>3. Qualitative, Categorical independent variables: Bridge to ANOVA。</p> <p>4. ANOVA, ANCOVA。</p> <p>5. Use and misuse of point estimation, hypothesis testing and confidence intervals。</p>		
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.)		
<p>統計專長專任教師、統計計算軟體以及硬體支援。</p> <p>Faculty with expertise in statistics, statistical computing and hardware supports</p>		
課程要求和教學方式之建議 Course Requirements and Suggested Teaching Methods		
<p>上課方式以講授、問答、並輔以project, presentation及討論為輔助。鼓勵學生在上課時多提出問題及對理論的見解及詮釋。使用 SAS或類似統計分析軟體進行實作。</p> <p>The course will be run mostly on lectures, Q&amp;A, discussion and guided project/presentation. Students' participation in explaining/discussing the theory and application implication is highly recommendation</p>		
其他 Miscellaneous		
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