

數學系課程核心教材內容

課程名稱：(中文) 類別資料分析 (英文) Categorical Data Analysis				開課單位	統科碩士班
				課程代碼	2316723
學分數	3	必/選修	選修	開課年級	一
<p>教學目標： This is an introductory course on categorical data analysis. It presents the most important methods for analyzing categorical data, such as chi-squared tests and measures of association, logistic regression, and loglinear models. These methods are widely used in the social, behavioral, public health, marketing, education, agricultural and biomedical sciences. Students are expected to have some background on estimation and hypothesis testing as well as some exposure to regression models and analysis of variance.</p> <p>課程概述： The basics of categorical data analysis are covered in Chapters 1-8. Chapter 2 surveys standard descriptive and inferential methods for contingency tables, such as odds ratios, tests of independence, and conditional vs marginal associations. Chapter 3 introduces generalized linear models for binary data and count data. Chapter 4 and 5 discuss the most important such model for binomial (binary) data, logistic regression. Chapter 6 introduces logistic regression models for multinomial responses. Chapter 7 discusses loglinear models for Poisson (count) data. Chapter 8 presents methods for matched-pairs data.</p> <p>先修科目或先備能力：</p>					
建議參考書目	An Introduction to Categorical Data Analysis., by A. Agresti, Wiley				

課程大綱

單元主題	內容綱要	上課週數
Introduction	(i) Statistical Inference for a Proportion (ii) Wald, Likelihood-Ratio, and Score Inference (iii) Wald, Likelihood-Ratio, and Score Inference for Binomial Parameter (iv) Small Sample Binomial Inference (v) Inference Based on the Mid P -value	2
Contingency Tables	(i) Probability Structure for Contingency Tables (ii) Comparing Proportions in Two-by Two Tables (iii) The Odds Ratio (iv) Chi-Squared Tests of Independence (v) Testing Independence for Ordinal Data (vi) Exact Inference for Small Samples (vii) Association in Three-Way Tables	4

Generalized Linear Models	<ul style="list-style-type: none"> (i) Components of Generalized Linear Model (ii) Generalized Linear Models for Binary Data (iii) Generalized Linear Models for Count Data (iv) Statistical Inference and Model Checking (v) Fitting Generalized Linear Models 	4
Logistic Regression Models	<ul style="list-style-type: none"> (i) Interpreting the Logistic Regression Model (ii) Inference for Logistic Regression (iii) Logistic Regression with Categorical Predictors (iv) Multiple Logistic Regression 	3
Loglinear Models	<ul style="list-style-type: none"> (i) Loglinear Models for Two-Way and Three-Way Tables (ii) Inference for Loglinear Models (iii) The Loglinear-Logistic Connection (iv) Independence Graphs and Collapsibility 	3