數學系課程核心教材內容

課程名稱：(中文) 生物統計				開課單位	統科碩士班
(英文) Biostatistics				課程代碼	2315775
學分數	3	必/選修	選修	開課年級	一

教學目標：
This course is designed to motivate students to master the statistical methods that are most often used in the medical literature. Therefore, most of the examples and exercise in this course are based either on actual articles from the medical literature or on actual medical research problems at the Harvard Medical School.

課程概述：
This introductory-level biostatistics course is designed for upper-level undergraduate or graduate students interested in medicine or other health-related areas.　This course will discuss the contents of introductory biostatistics first, and then focus on some common used statistical methods in biostatistics.　In the last part of this course will cover more advanced statistical techniques used in recent epidemiologic studies.

先修科目或先備能力：

建議參考書目	Fundamentals of Biostatistics by Bernard Rosner

課程大綱

單元主題	內容綱要	上課週數
General Overview	(ⅰ) Introduction (ii) Bayes' rule and Screening Tests (iii) ROC Curve (iv) Prevalence and Incidence	2
Hypothesis Testing	(ⅰ) One-Sample Test for the Mean of a Normal Distribution (ii) One-Sample χ^2 Test for the Variance of a Normal Normal Distribution (iii) The Relationship between Hypothesis Testing and Confidence Intervals (iv) The Paired T test (ⅴ) Interval Estimation for the Comparison of Means from Two paired Samples (ⅵ) Two-Sample T test for Independence Samples with Equal Variance (vii) Testing for the Equality of Two Variances (viii) Two-Sample T test for Independence Samples with Unequal Variance	3

Power and Sample Size Determination	(i) Power of a Test and the Sample Size Determination for One-Sample Inference (ii) Estimation of Sample Size and Power for Comparing Two Means (iii) Sample-Size Estimation for Longitudinal Studies (iv) Estimating of Sample Size and Power for Comparing Two Binomial Proportions	3
Nonparametric Methods	(i) The Sign Test (ii) The Wilcoxon Signed-Rank Test (iii) The Wilcoxon Rank-Sum Test	2
Categorical Data Analysis	(i) Contingency Tables (ii) Fisher's Exact Test (iii) Two-Sample Test for Binomial Proportions for Matched-Pair Data (McNemar's Test) (iv) Chi-Square Goodness-of Fit Test	3
Design and Analysis Techniques for Epidemiologic Studies	(i) Methods of Inference for Stratified Categorical Data-Mantel-Haenszel Test (ii) Power and Sample Size Estimation for Stratified Categorical Data (iii) Logistic Regression (iv) Meta-Analysis	3