國立清華大學 112 學年第 2 學期新開課程課程大綱

科號 Course Number	11220THSM111200	學分 Credit	2	人數限制 Class Size	30
中文名稱 Course Title	生物統計				
英文名稱 Course English Title	Biostatistics				
任課教師 Instructor	施銘杰				
上課時間 Time	F3F4	上課教室 Room	育成 319 室		

課程簡述(必填) (最多 500 個中文字) 本欄位資料會上傳教育部課程網
Brief Course Description (required)　(50-200 words if possible, up to 1000 letters

本課程主要面向對統計方法分析生物醫學資料有興趣的大學部學生。課程前半部將著重統計概念的建立，了解為何需要利用統計方法分析資料，以及推論統計的邏輯基礎。後半部將介紹常用之統計檢定與回歸方法，並輔以因果推論的理論框架介紹，讓學生了解針對有興趣的研究議題，如何選擇適當的統計模型進行資料分析後，解讀分析結果並給出結論。課程並附有電腦實作課，以供學生實地演練生物醫學資料之統計分析。

請輸入課程內容「中文暨英文關鍵字」至少 5 個, 每個關鍵字至多 20 個中文, 以半形逗點分隔 (必填)
Please fill in at least 5 course keywords (up to 40 letters for each keyword) and use commas to separate them.(required)

生物統計（Biostatistics）；描述性統計（Descriptive statistics）；推論性統計（Inferential statistics）；假說檢定（Hypothesis testing）；區間估計（Interval estimation）；迴歸分析（Regression analysis）；因果推論（Causal inference）

一、課程說明	This 2-credit course is designed for undergraduate students interested in analysis of biomedical data using statistical models. In the first part of the course, we will look into the theoretical foundation of statistics (with minimal formula derivation), and demonstrate how descriptive and inferential statistics can facilitate data summarization and evidence generation.

	In the second part of the course, we will introduce hypothesis tests and regression models commonly used in the biomedical literature. We will elaborate how to choose between the tests and models based on the question and data at hand, to interpret the analysis results and draw conclusions. We will also introduce the conceptual framework of causal inference and demonstrate how regression models can help us estimate the causal effect of interest. There will be several computer laboratory tutorials using SPSS to carry out the analyses described in the lectures. There are no pre-requisites for this course.
二、指定用書	Class handouts with related references
三、參考書籍	Triola, M. M., Triola, M. F., & Roy, J. (2017). Biostatistics for the biological and health sciences (2nd ed.). Upper Saddle River, NJ: Pearson.
四、教學方式	In-class lectures and statistical package tutorials

五、教學進度

（日期標記「*」代表當天於電腦教室上課）

週次	日期	標題
1	0223	Intro to biostatistics / Descriptive statistics
2	0301	Data visualization / Probability and distributions (I)
3	0308*	Probability and distributions (II), Disease measurement in epidemiology
4	0315	Inferential statistics: parameter estimation and hypothesis testing
5	0322	Inferential statistics: confidence intervals / Inference from one sample
6	0329*	Inference from two samples
7	0405	*Spring break, no class [Midterm assignment]*
8	0412	Simple linear regression, correlation and *t*-test
9	0419	Multiple linear regression and ANOVA
10	0426*	Interaction and non-linear regression
11	0503	Regression and causal inference
12	0510	Inferences from contingency tables

	13	0517*	Logistic regression
	14	0524	Survival analysis
	15	0531*	Regression methods for survival analysis
	16	0607	Final Exam
六、成績考核	In-class performance and exit quizzes (20%) Assignments (25%) Midterm assignment (25%) Final exam (30%)		
七、可連結之網頁位址(相關網頁)			