國立東華大學

教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	統計專論(一)			學年/學期 Academic Year/Semester	113/2
課程名稱(英文) Course Name in English	Topics in Statistics (I)				
科目代碼 Course Code	AM__55700	系級 Department & Year	碩士	開課單位 Course-Offering Department	應用數學系
修別 Type	選修 Elective	學分數/時間 Credit(s)/Hour(s)	3.0/3.0		
授課教師 Instructor	/簡立欣				
先修課程 Prerequisite					

課程描述 Course Description

本課程主要介紹利用群體資料進行基因體研究相關的統計方法，包含方法背後的問題背景，以及相關統計概念。
This course primarily introduces statistical methods for genomic research using population data, including the background of the problems behind these methods and relevant statistical concepts.

課程目標 Course Objectives

由任課教師專長區分，設定個別目標。
Course objectives are subject to the expertise of the instructor.

	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	具備專業機率、統計知識與應用分析能力。Have well-founded expertise in probability and statistics, and good analytical ability in solving real problems.	●
B	具備程式設計與統計計算能力。Have the computer programming and statistical computing skills.	○
C	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.	○

圖示說明Illustration ：● 高度相關 Highly correlated ○中度相關 Moderately correlated

授 課 進 度 表 Teaching Schedule & Content

週次Week	內容 Subject/Topics	備註Remarks
1	Introduction	
2	Fundamental Concepts and the Human Genome	
3	Hardy-Weinberg Equilibrium/Linkage Disequilibrium	
4	Population Structure and Stratification	
5	Genome-Wide Association Studies (GWAS)	
6	Statistical Models for Genetic Data Analysis	
7	Statistical Models for Genetic Data Analysis	
8	Statistical Models for Genetic Data Analysis	

9	期中考試週 Midterm Exam	
10	Heritability	
11	Heritability / Genotype Imputation	
12	Genotype Imputation	
13	Meta-analysis	
14	Meta-analysis	
15	Mendelian Randomization and Instrumental Variables	
16	Mendelian Randomization and Instrumental Variables	
17	Final Report	
18	Final Report	

教 學 策 略 Teaching Strategies

☑ 課堂講授 Lecture ☐ 分組討論Group Discussion ☐ 參觀實習 Field Trip

☐ 其他Miscellaneous:

教 學 創 新 自 評 Teaching Self-Evaluation

創新教學(Innovative Teaching)

☑ 問題導向學習(PBL) ☐ 團體合作學習(TBL) ☐ 解決導向學習(SBL)

☐ 翻轉教室 Flipped Classroom ☐ 磨課師 Moocs

社會責任(Social Responsibility)

☐ 在地實踐Community Practice ☐ 產學合作 Industy-Academia Cooperation

跨域合作(Transdisciplinary Projects)

☐ 跨界教學Transdisciplinary Teaching ☐ 跨院系教學Inter-collegiate Teaching

☐ 業師合授 Courses Co-taught with Industry Practitioners

其它 other:

學期成績計算及多元評量方式 Grading & Assessments									
配分項目 Items	配分比例 Percentage	多元評量方式 Assessments							
		測驗 會考	實作 觀察	口頭 發表	專題 研究	創作 展演	卷宗 評量	證照 檢定	其他
平時成績 General Performance	10%		✓						
期中考成績 Midterm Exam	30%	✓							
期末考成績 Final Exam	30%			✓	✓				
作業成績 Homework and/or Assignments	30%		✓						
其他 Miscellaneous (_____)	0%								

評量方式補充說明
Grading & Assessments Supplemental instructions

教科書與參考書目（書名、作者、書局、代理商、說明）
Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)

1. Mills, Melinda, Nicola Barban, and Felix C Tropf. An Introduction to Statistical Genetic Data Analysis / Melinda C. Mills, Nicola Barban, and Felix C. Tropf. Cambridge, Massachusetts: The MIT Press, 2020. Print.
2. https://genome.sph.umich.edu/wiki/Biostatistics_666:_Main_Page
3. Ziegler, Andreas ; König, Inke R.(2010) A Statistical Approach to Genetic Epidemiology: With Access to E-Learning Platform by Friedrich Pahlke, Second Edition.

課程教材網址(含線上教學資訊,教師個人網址請列位於本校內之網址)
Teaching Aids & Teacher's Website(Including online teaching information. Personal website can be listed here.)

其他補充說明 (Supplemental instructions)