國立東華大學
教學計劃表　Syllabus

課程名稱(中文) Course Name in Chinese	基礎機率AA			學年/學期 Academic Year/Semester		107/1
課程名稱(英文) Course Name in English	Introduction to Probability					
科目代碼 Course Code	AM__2080AA	系級 Department & Year	學二	開課單位 Course-Offering Department		應用數學系
修別 Type	學程 Program	學分數/時間 Credit(s)/Hour(s)		3.0/3.0		
授課教師 Instructor	/曹振海					
先修課程 Prerequisite	/#微積分(一)/#微積分(二)					

課程描述　Course Description

Probability is a foundation for scientific investigation under uncertainty. Besides, it is the backbone of statistics which is yet another important and powerful principle and toolbox for data science. This course serves as the first course to probability. The topics can be categorized into
1. Probability
2. Discrete Distributions
3. Continuous Distributions
4. Bivariate Distributions
5. Distributions of Functions of Random Variables
6. Limiting Theorems

課程目標　Course Objectives

本課程之目標在幫助應數系同學能熟悉機率論之基本概念及理論發展，以奠定修讀機率論及統計學之基礎。課程內容以介紹基礎機率論為主，包括機率的公設、條件機率與獨立性、隨機變數、期望值、變異數、離散型的隨機變數及機率分布、連續型的隨機變數及機率分布等重要主題。

The objective of this course is to help students learn the basic concepts and the theoretical development in probability theory, and get necessary background to take further courses in probabilities and statistics. The contents focus on basic materials, including following important topics: axioms of probability, conditional probability and independence, random variables, expectation, variance, discrete random variables and probability distributions, continuous random variables and probability distributions.

	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

授 課 進 度 表 Teaching Schedule & Content

週次Week	內容 Subject/Topics	備註Remarks

1	1. Overview of Probability-1: Descriptive Statistics, Properties of Probability,	Subject to minor change for better learning results
2	1. Overview of Probability-2: Conditional Probability, Independence, Bayes Theorem	
3	2. Discrete Distributions-1: Random variables of discrete type, mean and variance,	
4	2. Discrete Distributions-2: Bernoulli distribution and related theorems, moment generating function, Poisson Distribution	
5	3. Continuous Distributions-1: Continuous type data, EDA and descriptive stat recap,	
6	3. Continuous Distributions-2: random variable of continuous type,	
7	3. Continuous Distributions-3: uniform and exponential distributions, normal distribution	
8	Selected topics	
9	期中考試週 Midterm Exam	
10	4. Bivariate distributions-1: Distributions of two variables, correlation	
11	4. Bivariate distributions-2: conditional distribution	
12	4. Bivariate distributions-3: bivariate normal distribution	
13	5. Distributions of functions of random variables-1: Functions of one variable, transformations of two r.v.'s,	
14	5. Distributions of functions of random variables-2: several independent r.v.s', moment generating function technique,	
15	5. Distributions of functions of random variables-3: functions of normal r.v.s',	
16	6. Limiting Theorems-1:Some theorems of limiting distributions,	
17	6. Limiting Theorems-2:Law of Large Number and Central Limiting Theorem.	
18	期末考試週 Final Exam	

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:

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	5%								配分比例依左列百分比為原則，必要時略作調整。
期中考成績 Midterm Exam	35%								
期末考成績 Final Exam	40%								
作業成績 Homework and/or Assignments	20%								And Quizess
其他 Miscellaneous (_____)									

學期成績計算及多元評量方式 Grading & Assessments

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.)

Probability and Statistical Inference. Hogg and Tanis (2014), 8th Edition, Prentice-Hall (Text Book. earlier versions borrowable at AM office Library)

課程教材網址（教師個人網址請列在本校內之網址）
Teaching Aids & Teacher's Website (Personal website can be listed here.)

TBA

其他補充說明（Supplemental instructions）