國立東華大學

課　　綱　Course Outline

理工學院學士班

中文課程名稱 Course Name in Chinese	機率與統計				
英文課程名稱 Course Name in English	Probability and Statistics				
科目代碼 Course Code	TCAI10020	班 別 Degree	學士班 Bachelor’s		
修別 Type	學程 Program	學分數 Credit(s)	3.0	時 數 Hour(s)	3.0
先修課程 Prerequisite					

課程目標
Course Objectives

1. Experiments, Models, and Probabilities
1) Applying Set Theory to Probability
2) Conditional Probability
3) Independence
2. Basics of Random Variables
1) Definitions
2) Probability Mass Function (PMF)
3) Families of Discrete Random Variables
4) Cumulative Distribution Function (CDF)
5) Probability Density Function (PDF)
6) Families of Continuous Random Variables
3. Random Variables and Expected Value
1) Conditional Probability Mass/Density Function
2) Probability Models of Derived Random Variables
3) Variance and Standard Deviation
4) Expected Value of a Derived Random Variable
4. Multiple Random Variables
1) Joint Cumulative Distribution Function
2) Joint Probability Mass/Density Function
3) Marginal PMF/PDF
4) Functions of Two Random Variables
5) Conditioning by a Random Variable
6) Independent Random Variables
5. Sums of Random Variables
1) Expected Values of Sums
2) PDF of the Sum of Two Random Variables
3) Moment Generating Functions
4) MGF of the Sum of Independent Random Variables
5) Random Sums of Independent Random Variables
6) Central Limit Theorem

7) Law of Large Numbers	
院教育目標 College.'s Education Objectives	
1	培育專業知能，提升學習能力 Acquisition of professional competence and enhancement of learning abilities.

院基本素養與核心能力 College Basic Learning Outcomes		課程目標與院基本素養與核心能力 Correlation between Course Objectives and Basic Learning Outcomes
A	具備數理基本知識、邏輯推理、分析解決問題之能力。 Basic math knowledge, logical reasoning, analytical and problem-solving skills.	
B	具備中外語言表達溝通技巧，以養成團隊合作的能力。 Ability to express ideas and communicate in Chinese and foreign languages and teamwork skills.	
C	具備終身學習的能力。 Lifelong learning ability.	

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

課程大綱
Course Outline

1.機率課程簡介
2.機率概論、集合論與機率名詞
3.機率公理性質與條件機率
4.機率的獨立性與數數算機率
5.隨機變數、累積分布函數（CDF）與機率質量函數（PMF）、離散機率分佈I
6.離散機率分佈II、機率密度函數PDF與連續機率分佈I
7.連續機率分佈 II與期望值 I
8.期望值 II、隨機變數之函數、條件機率分佈與失憶性
9.期中評量
10.聯合機率分佈、邊際機率分佈
11.雙變數期望值
12.給定某事件下之條件機率分佈與條件機率分佈(離散)
13.隨機變數之和、動差母函數MGF、多個隨機變數和與中央極限定理
14.機率不等式
15.信賴區間
16.二元假設檢定
17.期末評量

資源需求評估（師資專長之聘任、儀器設備的配合・・・等）
Resources Required (e.g. qualifications and expertise, instrument and equipment, etc.)

課程要求和教學方式之建議
Course Requirements and Suggested Teaching Methods

成績評量方式
課堂參與及作業(50%)
期中課程評量成績(25%)
期末課程評量成績(25%)

其他
Miscellaneous