

淡江大學 108 學年度第 1 學期課程教學計畫表

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| 課程名稱                                                                                                                                                                                                              | 線性代數                                                                                                                                                                                                                                                                                                                                         | 授課<br>教師 | 吳淑妃<br>WU SHU-FEI  |
|                                                                                                                                                                                                                   | LINEAR ALGEBRA                                                                                                                                                                                                                                                                                                                               |          |                    |
| 開課系級                                                                                                                                                                                                              | 統計二A                                                                                                                                                                                                                                                                                                                                         | 開課<br>資料 | 實體課程<br>必修 上學期 2學分 |
|                                                                                                                                                                                                                   | TLSXB2A                                                                                                                                                                                                                                                                                                                                      |          |                    |
| 系（ 所 ） 教 育 目 標                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                              |          |                    |
| 一、培育學生具基本的統計理論能力。<br>二、培育學生具數據分析的能力。<br>三、培育學生成為具管理素養的統計專才。                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                              |          |                    |
| 本課程對應院、系(所)核心能力之項目與比重                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                              |          |                    |
| B. 數學邏輯思考能力。(比重：100.00)                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                              |          |                    |
| 本課程對應校級基本素養之項目與比重                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                              |          |                    |
| 1. 全球視野。(比重：5.00)<br>5. 獨立思考。(比重：95.00)                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                              |          |                    |
| 課程簡介                                                                                                                                                                                                              | 學習矩陣的性質及其應用，學習並瞭解向量空間與向量空間的性質。整體課程包含：線性方程組、矩陣、行列式、向量空間、基底與座標化、線性變換、特徵值、特徵向量、矩陣的對角化、內積空間、二次型式。                                                                                                                                                                                                                                                |          |                    |
|                                                                                                                                                                                                                   | This course introduces the techniques in solving a linear system of equations, the matrix algebra and basic theory, the vector spaces, including the inner product spaces. It also introduces the eigenvalue problems and the diagonalization of a matrix. All of these topics are useful in statistical applications and many other fields. |          |                    |
| 本課程教學目標與認知、情意、技能目標之對應                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                              |          |                    |
| 將課程教學目標分別對應「認知(Cognitive)」、「情意(Affective)」與「技能(Psychomotor)」的各目標類型。<br><br>一、認知(Cognitive)：著重在該科目的事實、概念、程序、後設認知等各類知識之學習。<br>二、情意(Affective)：著重在該科目的興趣、倫理、態度、信念、價值觀等之學習。<br>三、技能(Psychomotor)：著重在該科目的肢體動作或技術操作之學習。 |                                                                                                                                                                                                                                                                                                                                              |          |                    |
| 序號                                                                                                                                                                                                                | 教學目標(中文)                                                                                                                                                                                                                                                                                                                                     | 教學目標(英文) |                    |

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|---|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | 學生能瞭解 線性方程組、矩陣、行列式、向量空間維度及矩陣的秩。                                   | Students are able to understand the solution of linear system, matrix algebra, determinant and definition of a vector space and able to use the basis and dimension of a vector space and the rank of a matrix in many applications.                                                                                             |
| 2 | 學生能計算特徵值與特徵值向量，並了解對稱方陣之對角化的性質；能說明線性變換及其基本性質；並描述線性變換的核域與值域；能描述內積空間 | Students are able to calculate eigenvalues and eigenvectors and understand the diagonalization of a symmetric matrix; to describe the meaning of a linear transformation and its fundamental properties; Students are also able to describe the kernel and range of a linear transformation; to describe an inner product space. |

教學目標之目標類型、核心能力、基本素養教學方法與評量方式

| 序號 | 目標類型 | 院、系(所)核心能力 | 校級基本素養 | 教學方法 | 評量方式 |
|----|------|------------|--------|------|------|
| 1  | 認知   | B          | 15     | 講述   | 測驗   |
| 2  | 認知   | B          | 15     | 講述   | 測驗   |

授課進度表

| 週次 | 日期起訖                    | 內 容 (Subject/Topics)                             | 備註 |
|----|-------------------------|--------------------------------------------------|----|
| 1  | 108/09/09~<br>108/09/15 | CHAPTER 1: Linear Equations and Vectors of $R^n$ |    |
| 2  | 108/09/16~<br>108/09/22 | CHAPTER 1: Linear Equations and Vectors of $R^n$ |    |
| 3  | 108/09/23~<br>108/09/29 | CHAPTER 1: Linear Equations and Vectors of $R^n$ |    |
| 4  | 108/09/30~<br>108/10/06 | CHAPTER 1: Linear Equations and Vectors of $R^n$ |    |
| 5  | 108/10/07~<br>108/10/13 | CHAPTER 1: Linear Equations and Vectors of $R^n$ |    |
| 6  | 108/10/14~<br>108/10/20 | CHAPTER 2: Matrices and Linear transformations   |    |
| 7  | 108/10/21~<br>108/10/27 | CHAPTER 2: Matrices and Linear transformations   |    |
| 8  | 108/10/28~<br>108/11/03 | CHAPTER 2: Matrices and Linear transformations   |    |
| 9  | 108/11/04~<br>108/11/10 | CHAPTER 2: Matrices and Linear transformations   |    |
| 10 | 108/11/11~<br>108/11/17 | 期中考試週                                            |    |
| 11 | 108/11/18~<br>108/11/24 | CHAPTER 2: Matrices and Linear transformations   |    |
| 12 | 108/11/25~<br>108/12/01 | CHAPTER 2: Matrices and Linear transformations   |    |
| 13 | 108/12/02~<br>108/12/08 | CHAPTER 3: Determinants and Eigenvectors         |    |

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|--------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 14           | 108/12/09~<br>108/12/15 | CHAPTER 3: Determinants and Eigenvectors                                                                                                                                                                                          |                    |
| 15           | 108/12/16~<br>108/12/22 | CHAPTER 3: Determinants and Eigenvectors                                                                                                                                                                                          |                    |
| 16           | 108/12/23~<br>108/12/29 | CHAPTER 3: Determinants and Eigenvectors                                                                                                                                                                                          | if time permitting |
| 17           | 108/12/30~<br>109/01/05 | CHAPTER 3: Determinants and Eigenvectors                                                                                                                                                                                          | if time permitting |
| 18           | 109/01/06~<br>109/01/12 | 期末考試週(本學期期末考試日期為:109/1/3-109/1/9)                                                                                                                                                                                                 |                    |
| 修課應<br>注意事項  |                         | ※請關掉手機或轉震動<br>※上課不可使用notebook或平板電腦,違規者學期總分扣五分<br>※上課不可吃東西,上課說話太大聲影響上課者,學期總分扣五分<br>※請使用正版教科書, 勿非法影印他人著作, 以免觸法                                                                                                                      |                    |
| 教學設備         |                         | 電腦、投影機                                                                                                                                                                                                                            |                    |
| 教科書與<br>教材   |                         | Linear Algebra with Applications, Gareth Williams. 滄海書局·2019年第9版                                                                                                                                                                  |                    |
| 參考文獻         |                         | Introduction to Linear Algebra: with Applications, DeFranza and Gagliardi, 東華書局·初等線性代數與應用,原著:Anton 9th Edition, 簡國清譯.<br>Elementary Linear Algebra with Supplemental Applications, 11th Edition, Howard Anton, Chris Rorres 歐亞書局· |                    |
| 批改作業<br>篇數   |                         | 篇 (本欄位僅適用於所授課程需批改作業之課程教師填寫)                                                                                                                                                                                                       |                    |
| 學期成績<br>計算方式 |                         | ◆出席率: 20.0 %    ◆平時評量:        %    ◆期中評量: 30.0 %<br>◆期末評量: 30.0 %<br>◆其他〈助教實習〉: 20.0 %                                                                                                                                            |                    |
| 備 考          |                         | 「教學計畫表管理系統」網址: <a href="https://info.ais.tku.edu.tw/csp">https://info.ais.tku.edu.tw/csp</a> 或由教務處首頁→教務資訊「教學計畫表管理系統」進入。<br><b>※不法影印是違法的行為。請使用正版教科書, 勿不法影印他人著作, 以免觸法。</b>                                                          |                    |