

淡江大學 1 1 1 學年度第 1 學期課程教學計畫表

課程名稱	微積分	授課 教師	張飛黃 CHANG, FEI-HUANG
	CALCULUS		
開課系級	資工-P	開課 資料	實體課程 必修 單學期 3學分
	TEIXB1P		
課程與SDGs 關聯性	SDG4 優質教育		
系 (所) 教育目標			
<p>一、通達專業知能。</p> <p>二、熟練實用技能。</p> <p>三、展現創意成果。</p>			
本課程對應院、系(所)核心能力之項目與比重			
<p>A. 程式設計應用能力。(比重：15.00)</p> <p>B. 數學推理演繹能力。(比重：40.00)</p> <p>C. 資訊系統實作能力。(比重：15.00)</p> <p>D. 網路技術應用能力。(比重：15.00)</p> <p>E. 資訊技能就業能力。(比重：15.00)</p>			
本課程對應校級基本素養之項目與比重			
<p>1. 全球視野。(比重：5.00)</p> <p>2. 資訊運用。(比重：20.00)</p> <p>3. 洞悉未來。(比重：10.00)</p> <p>4. 品德倫理。(比重：20.00)</p> <p>5. 獨立思考。(比重：30.00)</p> <p>6. 樂活健康。(比重：5.00)</p> <p>7. 團隊合作。(比重：5.00)</p> <p>8. 美學涵養。(比重：5.00)</p>			

課程簡介	本課程主要介紹微積分的理論、計算及應用。內容包括函數的極限與連續、微分和積分的定義與應用、微積分基本定理、反函數及其導函數、積分技巧等等。
	This course is an introduction to Calculus, its techniques and applications. Topics in this semester include limits and continuity of functions, definitions and applications of differentiation and integration, the fundamental theorem of Calculus, inverse functions and their derivatives, integration techniques and so on. The goal is to strengthen students' problem-solving skills as well as independent thinking abilities.

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。

- 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。
- 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。
- 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)
1	理解函數極限與連續、微分和積分理論的運算與應用、反函數及其導函數、積分技巧的概念，並實際運算。	Students are able to understand the concepts introduced, including limits and continuity of functions, the theory and applications of differentiation and integration, inverse functions and their derivatives, integral techniques. Moreover, they are able to apply and perform calculations in reality.

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	ABCDE	12345678	講述、討論	測驗、討論(含課堂、線上)、出席率

授課進度表

週次	日期起訖	內容 (Subject/Topics)	備註
1	111/09/05~ 111/09/11	1.5: The Limit of a Function, 1.6: Calculating Limits Using the Limit Laws, 1.7 The Precise Definition of a Limit, 1.8 Continuity	
2	111/09/12~ 111/09/18	2.1: Derivatives and Rates of Change, 2.2: The Derivative as a Function, 2.3: Differentiation formula	
3	111/09/19~ 111/09/25	2.4: Derivatives of Trigonometric Functions, 2.5: The Chain Rule, 2.6: Implicit Differentiation	
4	111/09/26~ 111/10/02	3.1: Maximum and Minimum Values, 3.2: The Mean Value Theorem 3.3: How Derivatives Affect the Shape of a Graph, 3.4: Limits at Infinity; Horizontal Asymptotes 3.5: Summary of Curve Sketching	

5	111/10/03~ 111/10/09	3.6: Optimization Problems, 3.8 Antiderivatives, 4.1: Areas and Distances, 4.2: The Definite Integral, 4.3: The Fundamental Theorem of Calculus, 4.4 Indefinite Integral	
6	111/10/10~ 111/10/16	4.5: The Substitution Rule, 5.1: Areas Between Curves 5.2: Volumes, 5.3: Volumes by Cylindrical Shells, 5.5 Average value of a Function	
7	111/10/17~ 111/10/23	6.1: Inverse Functions and Their Derivative, 6.2 Natural Logarithms Function, 6.3 Natural Exponential Function, 6.4 General Logarithms and Exponential Function	
8	111/10/24~ 111/10/30	6.6 Inverse Trigonometric Functions 6.7 Indeterminate Forms and l'Hospital's Rule	
9	111/10/31~ 111/11/06	7.1: Integration by Parts 7.2: Trigonometric Integrals 7.3: Trigonometric Substitution	
10	111/11/07~ 111/11/13	期中考試週	
11	111/11/14~ 111/11/20	7.4: Integration of Rational Functions by Partial Fractions 7.7: Improper Integrals	
12	111/11/21~ 111/11/27	10.1: Sequences 10.2: Series 10.3: The Integral Test and Estimates of Sums 10.4: The Comparison Tests 10.5: Alternating Series 10.6: Absolute Convergence and the Ratio and Root Tests 10.7: Strategy for Testing Series	
13	111/11/28~ 111/12/04	10.8: Power Series 10.9: Representations of Functions as Power Series 10.10: Taylor and Maclaurin Series	
14	111/12/05~ 111/12/11	12.1: Functions of Several Variables 12.2: Limits and Continuity 12.3: Partial Derivatives	
15	111/12/12~ 111/12/18	12.4: Tangent Planes and Linear Approximations 12.5: The Chain Rule 12.6: Directional Derivatives and the Gradient Vector	
16	111/12/19~ 111/12/25	12.7: Maximum and Minimum Values 12.8: Lagrange Multipliers	
17	111/12/26~ 112/01/01	13.1: Double Integrals over Rectangles 13.2: Double Integrals over General Regions	
18	112/01/02~ 112/01/08	期末考試週(本學期期末考試日期為:112/1/3-112/1/9)	
修課應 注意事項			
教學設備		(無)	
教科書與 教材		Essential Calculus, metric edition 2e, (2022) James Stewart, Daniel K. Clegg, Saleem Watson, Cengage Learning.	
參考文獻			

批改作業 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 計算方式	<p>◆出席率： 10.0 % ◆平時評量： % ◆期中評量：30.0 %</p> <p>◆期末評量：50.0 %</p> <p>◆其他〈演習課〉：10.0 %</p>
備 考	<p>「教學計畫表管理系統」網址：https://info.ais.tku.edu.tw/csp 或由教務處 首頁→教務資訊「教學計畫表管理系統」進入。</p> <p>※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。</p>