國立台灣科技大學 114學年 第2學期　課程大綱

Spring 2026 NTUST Course Outline

授課教師：楊亦東

Instructor:Yang, I-Tung

課程名稱：計算智慧於工程上的應用

Course Title：Application of Computational Intelligence in Engineering

2026/11/3

課程代號：CT5809701 Course Code 學分數：3 Credits	必選修：選修/半學年 Required/Electve:Elective/Half Yr. 先修課程： Prerequisites
節次教室：W6(E2-102) W7(E2-102) W8(E2-102) Time/Location	
專業核心能力： Core Professional Competencies	
課程網址： Course Website	
課程宗旨： Course Objectives	This course provides a thorough introduction to the theoretical background of computational intelligence, with a strong focus on metaheuristic algorithms. Students will explore the principles, design, and implementation of these algorithms, emphasizing their practical application to optimization problems in engineering. The course aims to equip students with the skills to develop and apply algorithms that are highly effective, efficient, and robust.
課程大綱： Outline of Lectures	This course provides an introduction to the background of metaheuristic algorithms while exploring essential topics like parameter setting, performance evaluation, and multiobjective optimization. To facilitate comprehensive applications, the course spans a broad spectrum of algorithms, including Genetic Algorithm, Particle Swarm Optimization, Tabu Search, Simulated Annealing, Ant Colony Optimization, Differential Evolution, and Symbiotic Organisms Search. Each algorithm contributes a distinct problem-solving approach, equipping students with a diverse toolkit to address a wide array of engineering optimization challenges.
授課方式： Method of Instruction	講授 Lecture：70% 分組討論 Group discussion：10% 案例研討 Case study：0% 操做練習 Practical exercises：20% 講授 Lecture：%
教科書： Textbooks	N/A
參考書目： References	

	1. Yang, X.S. (2014). "Nature-Inspired optimization algorithms." Elsevier, ISBN: 978-0124167438, E-Books at http://library.ntust.edu.tw 2. Talbi, E. (2009). "Metaheuristics: From design to implementation." Wiley, ISBN: 978-0470278581. 3. Reeves ed. (1995). "Modern heuristic techniques for combinatorial problems." McGraw-Hill, ISBN: 978-0077092399. 4. Keller, A.A. (2019). "Multi-objective optimization in theory and practice II: metaheuristic algorithms." ISBN: 978-1681087054 (E-Books).
修課須知： Notice	
評量方式： Grading	Homework 30%; Midterm presentation 25%, Final project 45%
備註說明： Notes	1. Although not mandatory, familiarity with programming languages such as Python, C++, or MATLAB can significantly enhance students' engagement and comprehension in this course. 2. Students may use AI to help generate code, but you must know how your code works and be prepared to explain or modify it.