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：林銘波

Instructor:Lin, Ming-Bo

課程名稱：高等計算機演算法

Course Title：Advanced Computer Algorithms

2026/11/3

課程代號： ET6501701 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： Time/Location	W2(IB-306) W3(IB-306) W4(IB-306)
專業核心能力： Core Professional Competencies	
課程網址： Course Website	
課程宗旨： Course Objectives	TThe objective of this course is to familiarize the student with the process of implementing a system-level algorithm at the RTL level in Verilog HDL. Upon completion, the student will be able to carry out the RTL (register-transfer level) design and implementation of a digital IC module (or IP) from a system-level algorithm. To reach this, this course will also focus on the applications of pipeline and parallel techniques to the RTL design and implementation of system-level algorithms.
課程大綱： Outline of Lectures	Parallel-prefix sums, Sorting networks, Number-theoretic algorithms, RSA cryptosystem, Finite fields and advanced encryption standard, Polynomials and the FFT, NP-Completeness, and Approximation algorithms.
授課方式： Method of Instruction	講授 Lecture：100% 分組討論 Group discussion：0% 案例研討 Case study：0% 操做練習 Practical exercises：0% 講授 Lecture：%
教科書： Textbooks	*Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein, Introduction to Algorithms, 4th ed., The MIT Press and McGraw-Hill Book Company, New York, 2022. (Note that any version is fine.)
參考書目： References	1. Robert Sedgewick and Kevin Wayne, Algorithms, 4th ed., Upper Saddle River, NJ: Addison-Wesley, 2011. 2. Udi Manber, Introduction to Algorithms --- A Creative Approach, Reading, Massachusetts: Addison-Wesley, 1989. 3. Ellis Horowitz, Sartaj Sahni, and Sanguthevar Rajasekaran, Computer Algorithms, New York: Computer Science Press, 1997. 4. Mark Allen Weiss, Data Structures \& Algorithm Analysis in C++, 4th ed., Upper Saddle River, NJ: Addison-Wesley, 2014.
修課須知： Notice	

評量方式： Grading	Homework (one simple term project): 40%; mid exam: 30%; final exam: 30%; bonus: class participation and extra homework (if any).
備註說明： Notes	必須熟悉『FPGA系統設計實務』與『計算機演算法』及『計算機程式設計』。