

朝陽科技大學 095學年度第1學期教學大綱
Parallel Computing 平行計算

當期課號	7433	Course Number	7433
授課教師	洪若偉	Instructor	HUNG,RUO WEI
中文課名	平行計算	Course Name	Parallel Computing
開課單位	資訊科技研究所博士班二A	Department	
修習別	選修	Required/Elective	Elective
學分數	3	Credits	3
課程目標	在許多科學領域中, 往往需要大量的計算需求與資料密集的應用. 由於這個理由, 平行計算獲得許多的注視, 且是一塊有趣的研究領域. 不同型式的平行系統已可讓使用者來使用. 我們不只處理一般的平行計算問題, 而且也介紹在高效能計算中所出現的種種問題.	Objectives	Applications with large computational requirements and data-intensive applications are rapidly evolving in many scientific domains. For this reason, parallel computing is gaining attention and is an area of interesting study. Different types of parallel systems are available to users. We deal not only with common parallel-processing problems but also with issues that have emerged in high-performance computing.
教材	課本: "Introduction to Parallel Computing", by A. Grama, A. Gupta, G. Karypis, and V. Kumar, 2nd Edition, Addison Wesley, 2003 (全華代理). + 投影片 參考書目: 1. "Parallel Programming in C with MPI and OpenMP", by Michael J. Quinn, McGraw Hill, 2004 (開發圖書公司代理). 2. "Parallel Computation-Models and Methods", by S.G. Akl, Prentice-Hall, 1997 (全華代理). 3. "The Design and Analysis of Parallel Algorithms", by S.G. Akl, Prentice-Hall, 1989.	Teaching Materials	Textbook: "Introduction to Parallel Computing", by A. Grama, A. Gupta, G. Karypis, and V. Kumar, 2nd Edition, Addison Wesley, 2003. + Slides Reference Books: 1. "Parallel Programming in C with MPI and OpenMP", by Michael J. Quinn, McGraw Hill, 2004. 2. "Parallel Computation-Models and Methods", by S.G. Akl, Prentice-Hall, 1997. 3. "The Design and Analysis of Parallel Algorithms", by S.G. Akl, Prentice-Hall, 1989.
成績評量方式	1. 兩次作業(Homework): 10% 2. 兩次小考(Quizzes): 20% 3. 期中考(Midterm): 30% 4. 期末平行程式project (Programming Report and Oral Presentation) / 條件式期末考 (Conditional Final Exam): 40% 5. 課程參與(Participation): 5%	Grading	1. Two Homeworks: 10% 2. Two Quizzes: 20% 3. Midterm Exam: 30% 4. Final Parallel Programming Report and Oral Presentation / Conditional Final Exam: 40% 5. Course Participation: 5%
教師網頁	http://csie.cyut.edu.tw/~rwhung		
教學內容	在許多科學領域中, 往往需要大量的計算需求與資料密集的應用. 由於這個理由, 平行計算獲得許多的注視, 且是一塊有趣的研究領域. 不同型式的平行系統已可讓使用者來使用. 我們不只處理一般的平行計算問題, 而且也介紹在高效能計算中所出現的種種問題. 這門課中所使用的程式設計標準包括: 訊息傳遞介面 (簡稱MPI), Unix上可攜式作業系統介面 (簡稱Posix), 及多重處理系統上的開放式規格 (OpenMP). 本課程將介紹如下主題: 平行演算法設計, 平行程式的分析模式, 訊息傳遞的程式設計, 共享記憶體程式設計, 平行的稀疏矩陣演算法, 平行的排序, 平行的圖行演算法, 與平行的蒐尋技巧演算法等.	Syllabus	Applications with large computational requirements and data-intensive applications are rapidly evolving in many scientific domains. For this reason, parallel computing is gaining attention and is an area of interesting study. Different types of parallel systems are available to users. We deal not only with common parallel-processing problems but also with issues that have emerged in high-performance computing. Programming standards in this course used are Message Passing Interface (MPI), Posix (Portable Operating System Interface for Unix) threads, and open specifications for multiprocessing (OpenMP). This course introduces the following

topics: Parallel Algorithm Design, Analytical Modeling of Parallel Programs, Message-Passing Programming, Programming Shared Address Space, Parallel Dense Matrix Algorithms, Parallel Sorting, Parallel Graph Algorithms, and Parallel Search Algorithms.

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