THE CHINESE UNIVERSITY OF HONG KONG
Print Course Catalog Details

Academic Org: Dept of Computer Sci & Engg – Subject: Computer Science

Course: CSCI4160 **Course ID:** 008265 **Eff Date:** 2022-07-01 **Crse Status: Active** **Apprv. Status:** Approved **[**Course Rev**]**

Distributed and Parallel Computing **分佈式及並行式計算**

This course introduces concepts, models, and implementations related to distributed and parallel computing. Topics include parallel and distributed programming, system architectures, synchronization, and concurrency control techniques.

本科旨在介紹關於分佈式及並行式計算之概念、模型及實踐。專題包括：並行式與分佈式系統之結構、並行語言、同步及並行控制技術。

Grade Descriptor:

A

EXCELLENT – exceptionally good performance far exceed expectation in all or most of the course learning outcomes. Demonstration of superior understanding of the subject matter, ability to analyze problems and apply extensive knowledge and skillful use of concepts and materials to derive proper solutions.

有關等級說明的資料，請參閱英文版本。

B

GOOD – good performances in all course learning outcomes and exceed expectation in some. Demonstration good understanding of the subject matter, ability to use proper concepts and materials to solve most of the problems encountered.

有關等級說明的資料，請參閱英文版本。

C

FAIR – adequate performance in all course learning outcomes. Demonstration of adequate understanding of the subject matter, ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

D

MARGINAL – performance barely meet the expectation in all or at least the essential course learning outcomes. Demonstration of partial understanding of the subject matter and ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

F

FAILURE – performance does not meet expectation in most the course learning outcomes. Demonstration of serious deficiencies and shall retake the course.

有關等級說明的資料，請參閱英文版本。

Equivalent Offering:
Units: 3 (Min) / 3 (Max) / 3 (Acad Progress)
Grading Basis: Graded
Repeat for Credit: N
Multiple Enroll: N
Course Attributes:

Topics:

COURSE OUTCOMES

Learning Outcomes:

1) Understand key distributed and parallel concepts including consistency, clock, commit, replication, synchronization, and consensus
2) Hands-on programming experience in distributed and parallel programming
3) Hands-on system experience in distributed systems and parallel hardware

Course Syllabus:

This course introduces concepts, models, and implementations related to distributed and parallel computing. Topics include SIMD, OpenMP, GPGPU, MPI, Roofline Analysis, Amdahl's law, Parallel Algorithms, Time & Order, Consensus, Byzantine Fault, Replicated State Machine, Leader Election, Consistency Model.

Assessment Type:

Essay test or exam	: 40%
Homework or assignment	: 30%
Project	: 30%

Feedback for Evaluation:

1. Course evaluation and questionnaire
2. Results of assignments and examination

3. Question-and-Answer sessions during class
4. Student consultation during office hours or online

Required Readings:

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Recommended Readings:

1) Tanenbaum, Andrew, and Maarten van Steen. Distributed Systems: Principles and Paradigms. Upper Saddle River, NJ: Prentice Hall, 2002. ISBN: 9780130888938.
2) Distributed Systems: Concepts and Design (5th Edition) 5th Edition by George Coulouris (Author), Jean Dollimore (Author), Tim Kindberg (Author), Gordon Blair (Author)
3) An introduction to Parallel Programming. Peter Pacheco. Morgan Kaufmann.

OFFERINGS

1. CSCI4160 — Acad Organization=CSD; Acad Career=UG

COMPONENTS

LEC : Size=30; Final Exam=Y; Contact=3
TUT : Size=30; Final Exam=N; Contact=1

ENROLMENT REQUIREMENTS

1. CSCI4160

Enrollment Requirement Group:
Prerequisite: CSCI3150 or ESTR3102.
Not for students who have taken ESTR4104

New Enrollment Requirement(s):
Pre-requisite = no change
Exclusion = no change

CAF

eLearning hrs for blended cls 0
No. of micro-modules 0
Research components (UG) 0%

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