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.

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.

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.

C

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

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.
有关等級說明的資料，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.

有关等級說明的資料，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:

Recommended Readings:
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%

---
