THE CHINESE UNIVERSITY OF HONG KONG
Print Course Catalog Details

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

Course: CSCI4230 **Course ID:** 012809 **Eff Date:** 2022-07-01 **Crse Status: Active** **Apprv. Status:** Approved **[**Course Rev**]**
Computational Learning Theory **計算學習論**

This course introduces theoretical foundations of efficient learning algorithms and their limitations. Topics include Probably Approximately Correct learning, Occam learning, Vapnik – Chervonenkis dimension, boosting, Statistical Query learning, active learning, and crypotgraphic hardness of learning.

本科介紹各款學習算法之理論根基與局限。內容涉及「多數大致正確」和「奧坎」學習模型、Vapnik – Chervonenkis 維數、提升法、統計提問學習、主動學習、密碼學引致的學習困難。

Grade Descriptor:

A

EXCELLENT – exceptionally good performance and far exceeding expectation in all or most of the course learning outcomes; demonstration of superior understanding of the subject matter, the 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 performance in all course learning outcomes and exceeding expectation in some of them; demonstration of good understanding of the subject matter and the 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 and meeting expectation in all course learning outcomes; demonstration of adequate understanding of the subject matter and the 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 meets the expectation in the essential course learning outcomes; demonstration of partial understanding of the subject matter and

the 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 the expectation in the essential course learning outcomes; demonstration of serious deficiencies and the need to 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:

At the end of the course of studies, students will have acquired the ability to
1. identify the mathematical models in various learning applications
2. analyze the performance of different learning algorithms
3. understand the relative computational hardness of various learning problems

Course Syllabus:

This course introduces theoretical foundations of efficient learning algorithms and their limitations. Topics include Probably Approximately Correct learning, Occam learning, Vapnik – Chervonenkis dimension, boosting, Statistical Query learning, active learning, and crypotgraphic hardness of learning.

Assessment Type:

Essay test or exam	: 50%
Homework or assignment	: 50%

Feedback for Evaluation:

1. Quiz and examinations
2. Course evaluation and questionnaire
3. Question-and-answer sessions during class
4. Student consultation during office hours or online

Required Readings:

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Recommended Readings:

1. Michael J. Kearns and Umesh Vazirani, An Introduction to Computational Learning Theory

OFFERINGS

1. CSCI4230 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. CSCI4230

Enrollment Requirement Group:
Prerequisite: ENGG2430 or 2450 or 2760 or 2780 or ESTR2002 or 2005 or 2018 or 2020 or 2308 or 2362 or IERG2470 or MIEG2440

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

CAF

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