THE CHINESE UNIVERSITY OF HONG KONG
Print Course Catalog Details

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

Course: CSCI3190 **Course ID:** 002591 **Eff Date:** 2022-07-01 **Crse Status: Active** **Apprv. Status:** Approved **[**Course Rev**]**

Introduction to Discrete Mathematics and Algorithms **離散數學及算法導論**

This course introduces logic, combinatorics, recurrence relations and graph theory. Design and analysis of algorithms: greedy method, divide and conquer, and dynamic programming. Fundamental algorithms including sorting, graph algorithms, number-theoretic algorithms and numerical algorithms. Introduction to NP-completeness.

本科介紹邏輯，組合學，遞歸關係與圖論。算法之設計與分析：優先策略，分治策略與動態規劃。基本算法包括排序，圖算法，數論算法與數值算法。NP - 完全性。

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:

Students will be able to
1. understand the concepts of logic, sets, functions, and graphs;
2. analyze the time complexity of an algorithm;
3. obtain good knowledge of fundamental sorting, graph, number-theoretic, and numerical algorithms;
4. design greedy, divide-and-conquer, and dynamic-programming algorithms to solve new problems;
5. comprehend the concepts of NP-hardness and basic reductions.

Course Syllabus:

This course introduces logic, combinatorics, recurrence relations and graph theory. Design and analysis of algorithms: greedy method, divide and conquer, and dynamic programming. Fundamental algorithms including sorting, graph algorithms, number-theoretic algorithms and numerical algorithms. Introduction to NP-completeness.

Assessment Type:

Essay test or exam	: 50%
Others	: 25%
Short answer test or exam	: 25%

Feedback for Evaluation:

1. Course evaluation questionnaire;
2. Results of assignments;
3. Results of exams;

Required Readings:

-

Recommended Readings:

1. Discrete Mathematics and Its Applications (5th Ed.), by K.H. Rosen, McGraw Hill.

OFFERINGS

1. CSCI3190 — 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. CSCI3190

Enrollment Requirement Group:

Not for students who have taken CSCI3160 or ENGG2440 or ESTR2004 or 3104.
Prerequisite: CSCI2100 or CSCI2520 or ESTR2102.
For 2nd-year entrants, the prerequisite will be waived.

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%