THE CHINESE UNIVERSITY OF HONG KONG
Print Course Catalog Details

Academic Org: Div of Computer Science & Engg – Subject: Computer Science

Course: CSCI5320 **Course ID:** 002635 **Eff Date:** 2024-07-01 **Crse Status: Active** **Apprv. Status:** Approved **[**New Course**]**
Topics in Graph Algorithms 圖算法專題

This course will discuss graph theory and graph algorithms with emphasis on the algorithmic aspects of graph theory. The course will cover classical topics such as search techniques, connectivity, colouring, matching and covering, network flows, planarity, traversability, perfect graphs, and NP-completeness of graph problems. The course will also discuss FPT algorithms for solving graph problems.

本科討論圖論與圖論算法。內容包括經典課題之搜索技術，連通性，著色，匹配與覆蓋，網絡流，平面圖，周游性，完美圖，以及圖論問題的NP - 完全性。本科也討論解決圖問題的FPT演算法。

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: MSc Computer Science
MPhil-PhD Computer Sci & Erg

Topics:

COURSE OUTCOMES

Learning Outcomes:

At the end of the course of studies, students will have acquired the ability to
1. use some fundamental graph algorithms to solve other graph problems,
2. establish NP-completeness of graph problems, and
3. use various tools to design FPT algorithms to solve NP-complete graph problems in practice.

Course Syllabus:

This course will discuss graph theory and graph algorithms with emphasis on the algorithmic aspects of graph theory. The course will cover classical topics such as search techniques, connectivity, colouring, matching and covering, network flows, planarity, traversability, perfect graphs, and NP-completeness of graph problems. The course will also discuss FPT algorithms for solving graph problems.

Assessment Type: Others : 100%

Feedback for Evaluation:

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

Required Readings:

To be provided by course teacher.

Recommended Readings:

1. D. West, Introduction to Graph Theory, Prentice Hall, 2001.
2. M. Ashraf Iqbal, Graph Theory & Algorithms, 2010.
3. R.G. Downey and M.R. Fellows, Parameterized Complexity, Springer, 1997.
4. M.R, Garey, and D.S. Johnson, Computers and Intractability: A Guide to the Theory of NP-Completeness, W. H. Freeman and Company, 1979.

OFFERINGS

1. CSCI5320 Acad Organization=CSEGV; Acad Career=RPG

COMPONENTS

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

ENROLMENT REQUIREMENTS

1. CSCI5320

Enrollment Requirement Group:
For students in MSc Computer Science; or
For students in MPhil-PhD Computer Science & Engineering; or
For students in UG Computer Science; or
For students in UG Computer Engineering;
Prerequisite: CSCI3160

Additional Information

VTL-Onsite face-to-face hrs 0
VTL-Online synch. hrs 0
VTL-Online asynch. hrs 0

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