THE CHINESE UNIVERSITY OF HONG KONG
Print Course Catalog Details

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

Course: CSCI5010 **Course ID:** 009696 **Eff Date:** 2024-07-01 **Crse Status: Active** **Apprv. Status:** Approved **[**New Course**]**
Practical Computational Geometry Algorithms 實用計算幾何算法

This course will discuss data structures and algorithms for solving fundamental problems in computational geometry with good theoretical guarantees. Topics covered include line-segment intersection, polygon triangulation, convex hull, linear programming, orthogonal range searching, point location, voronoi diagram, delaunay triangulation, and so on.

本科將討論為解決計算幾何中的基本問題，並具有良好的理論保障的數據結構和算法。涵蓋的主題包括線段相交，多邊形三角化，凸包，線性規劃，正交範圍搜索，點位置，Voronoi圖，Delaunay三角網，等等。

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. understand algorithms for solving fundamental problems in computational geometry.
2. learn and develop techniques for designing and analyzing computational geometry algorithms with non-trivial theoretical guarantees.

Course Syllabus:

This course will discuss data structures and algorithms for solving fundamental problems in computational geometry with good theoretical guarantees. Topics covered include line-segment intersection, polygon triangulation, convex hull, linear programming, orthogonal range searching, point location, voronoi diagram, delaunay triangulation, and so on.

Assessment Type:

Essay test or exam	: 60%
Others	: 40%

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:

Computational Geometry, Algorithms and Applications. By Mark de Berg, Marc van Kreveld, Mark Overmars, and Otfried Schwarzkopf. Springer-Verlag, 1997.

Reference:
Computational Geometry in C. By Joseph O'Rourke. Cambridge University Press, second edition, 1998

OFFERINGS

1. CSCI5010 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. CSCI5010

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: CSCI2100 or ESTR2102 or CSCI2520 or equivalent

Additional Information

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

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