Course: CSCI5370  
Course ID: 002640  
Eff Date: 2022-07-01  
Crse Status: Active  
Apprv. Status: Approved

Quantum Computing 量子計算

This course provides an introduction to the following topics in quantum computation: 1. Models of quantum computation and communication; 2. Quantum algorithms and their limitations; 3. Other topics (quantum communication, quantum cryptography, quantum proofs, quantum error correction, quantum supremacy).

本科介紹量子計算中的以下主題：1. 量子計算與通信模型；2. 量子算法及其局限性；3. 其他主題（量子通信，量子密碼學，量子證明，量子糾錯，量子優越性）。

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.
有关等級說明的資料，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.

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

1. understand the power and limitations of quantum computation;
2. be able to program a quantum computer;
3. be able to use and modify existing quantum algorithms in computational applications.

Course Syllabus:
This course provides an introduction to the following topics in quantum computation: 1. Models of quantum computation and communication; 2. Quantum algorithms and their limitations; 3. Other topics (quantum communication, quantum cryptography, quantum proofs, quantum error correction, quantum supremacy).

Assessment Type:
Homework or assignment : 30%
Presentation : 40%
Test or quiz : 30%
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:

To be provided by course instructor.

Recommended Readings:


OFFERINGS

1. CSCI5370 Acad Organization=CSEG; Acad Career=RPG

COMPONENTS

LEC : Size=30; Final Exam=Y; Contact=3

ENROLMENT REQUIREMENTS

1. CSCI5370

   Enrollment Requirement Group:
   For students in MSc Computer Science; or
   For students in MPhil-PhD Computer Science & Engineering; or
   For undergraduate students in Computer Science (CSCIU & CSCIN) or Computer Engineering (CENGU & CENGN)

CAF

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