Course Code	Course Title
COMP 2711	**Discrete Mathematical Tools for Computer Science**

Course Description

Basic concepts in discrete mathematics needed for the study of computer science: enumeration techniques, basic number theory, logic and proofs, recursion and recurrences, probability theory and graph theory. The approach of this course is specifically computer science application oriented. Prerequisite(s): A passing grade in AL Pure Mathematics/AL Applied Mathematics; OR level 3 or above in HKDSE Mathematics Extended Module M1/M2; Corequisite(s): (For students without prerequisites) MATH 1012 OR MATH 1013 OR MATH 1014 OR MATH 1020 OR MATH 1023 OR MATH 1024; Exclusion(s): COMP 2711H, MATH 2343

List of Topics

- Introduction
- Logic
- Sets and functions
- Number theory
- Algorithms
- Induction and recursion
- Counting
- Probability
- Graphs

Textbook

Discrete Mathematics and its Applications, Kenneth H. Rosen, 7th or 8th Edition, McGraw-Hill

Reference books

N/A

Grading Scheme

Homework	20%
In-class quizzes	10%
Mid-term Exam	25%
Final Exam	45%

Total	100%

There will be 6 homework assignments throughout the course. Your total homework score will be the sum of the 5 highest scores out of these 6 homework assignments.

Homework late Policy: 1 point for every hour late.

The exams may have optional bonus questions that are more challenging than the normal questions. The final letter grades will be first assigned without counting these bonus questions. Then the bonus questions will be added to your final score for possible grade promotion (at most one sub-grade).

Course Intended Learning Outcomes

On successful completion of this course, students are expected to be able to:

1. Understand the formulation of common problems in several areas of discrete mathematics, including combinatorics, number theory and cryptography, logic and proof, recursion and recurrences, probability theory and graph theory.
2. Understand the connection between the discrete mathematical tools learned and some core computer science topics covered later in the curriculum, including computational complexity, information security, recursive functions and data structures.
3. Apply the mathematical techniques learned to solve problems in a range of topics.
4. Demonstrate a level of mathematical maturity by solving problems using an array of different proof techniques.

Assessment Rubric

N/A