

COMP S264F Discrete Mathematics Course Guide

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Tutor:	Mr. FUNG Yin Chun, YC ycfung@study.ouhk.edu.hk
Lecture:	Tue 14:00 – 16:00, Online via Zoom Fri 11:00 – 12:00, Main Campus (MC) C0518
Tutorial:	Fri 12:00 – 13:00, Main Campus (MC) C0518

* You are required to attend **all** the lectures and tutorials. Tuesday's classes will be in online mode only, while the Friday's classes will be in mixed mode (face-to-face and online via Zoom).

Textbook

Rosen, K. (2018). *Discrete Mathematics and Its Applications* (8th ed.). McGraw-Hill Education.

Assessment Scheme

- Continuous Assessment (30%):
 - Online Exercises (10%):
 - They will be given **during** the lectures and/or tutorials.
 - Mid-term Test (10%):
 - November 24, 2020 (Tue) 14:00 – 16:00 (after the study break)
 - Assignment (10%):
 - To help you better prepare the examination.
 - Submission deadline: December 22, 2020 (Tue, tentative)
- Examination (70%)

* To pass the course, you must get at least 40 marks for both the continuous assessment and exam.

Course Content (*subject to change)

Topics	
1	Logic: propositions, logical operators, truth tables, logical equivalence, De Morgan's laws, predicates, universal & existential quantifiers
2	Methods of proof: inference rules, direct proof, proof by contraposition, proof by cases, proof by contradiction, mathematical induction (MI)
3	Set theory: set notations, set operators, power sets, Cartesian products, Venn diagrams, set equalities, subset relations
4	Functions: domain, image, range of functions; one-to-one (injective), onto (surjective), bijective functions; inverse functions; composite functions; function plotting; common functions: floor, ceiling, exponential, logarithmic, modulus; cardinality of infinite sets (countable / uncountable)
5	Basics of counting: sum rule, product rule, principle of inclusion-exclusion, pigeonhole principle
6	Combinatorics: permutations, permutations with repetition, combinations, combinations with repetition, lower bounds for discrete problems, combinatorial proofs
7	Discrete probability: experiments, outcomes, sample spaces, events, complement, union, intersection, event probabilities, probabilistic methods for proving existence of particular outcomes
8	Conditional probability and random variables: conditional probabilities, independent events, sample space with not equally likely outcomes, expected values of random variables, sum rule, product rule