

Math 2043 Honor Analysis  
Course outline – Fall 2023-2024

1. Instructor: Min Yan

Room: 3484, Phone: 23587442, e-mail: mamyan@ust.hk

2. Meeting Time and Venue

Lecture: Mon 16:30 - 17:50, Fri 12:00-13:20, Lecture Theatre E

Tutorial: Tue 18:00 - 18:50, Room 2406

3. Course Description

Duration: one semester

Credit: 3 units

Synopsis: This course teaches foundational materials in mathematics. Topics include logic, set and map, number systems, integers and polynomials, counting.

4. Intended Learning Outcomes

Upon successful completion of this course, students should be able:

- \* Analyze and explain concepts from the foundations of mathematics;
- \* Demonstrate accurate and efficient use of logical technique;
- \* Construct and express logical arguments;
- \* Identify and apply appropriate techniques for solving common mathematical problems.

5. Assessment Scheme

20% homework, 30% midterm, 50% final

6. Student Learning Resources

Lecture notes written by the instructor.

7. Teaching and Learning Activities

Lectures: focus on illustrating the concepts of the course content.

Tutorials: focus on examples and problem solving skills.

8. Course Content

1) Logic: statement, quantifier, proof, induction

2) Set and Map: set, union, intersection, difference, map, image, preimage, onto, one-to-one, inverse, equivalence relation

3) Number: natural number, integer, rational number, real number, exponential, complex number

4) Integer and Polynomial: division, decimal expansion, prime, factorisation, greatest common divisor, congruence, divisibility criterion

5) Counting: finite, infinite, cardinal, ordinal, countability