



**NANYANG  
TECHNOLOGICAL  
UNIVERSITY**  
SINGAPORE

# Discrete Mathematics

## MH1812

### Introduction

# Welcome to Discrete Mathematics

# Lecturer

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## **Dr Gary GREAVES**

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Office: SPMS-MAS-05-03

Consultation hours: by appointment



# Video Lectures

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**Dr Gary GREAVES**

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**Asst Prof GUO Jian**

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**Assoc Prof WANG Huaxiong**

Email: [hxwang@ntu.edu.sg](mailto:hxwang@ntu.edu.sg)



# Teaching Assistants/Tutors

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- Chen Ziwen : [zwchen@ntu.edu.sg](mailto:zwchen@ntu.edu.sg)
- Jeven Syatriadi: [jeve0002@e.ntu.edu.sg](mailto:jeve0002@e.ntu.edu.sg)
- He Yimeng: [yimeng002@e.ntu.edu.sg](mailto:yimeng002@e.ntu.edu.sg)

# Schedule

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1. Log on to NTULearn
2. Watch online video lessons each week
3. Attend a 1 hour F2F lecture each week (Fridays 15:30 – 16:20)
4. Attend a 1 hour tutorial session each week (commencing from Week 2)

# Course Introduction

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- This course serves as an introduction to **various topics** in discrete mathematics
- Familiarity with formal analysis through simple problems in some basic discrete structures is a key objective **rather than knowing these structures in depth**
- Specifically, the main aim is to learn topics from the following broad areas of discrete mathematics: **number theory, logic, combinatorics, and graph theory**
- This course aims to provide a **solid mathematical foundation** and is intended for first year computer science and computer engineering students

# Learning Outcomes

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By the end of this course, you should be able to:

1. Identify which integers are **congruent modulo** a positive integer
2. Formulate, interpret, and manipulate **logical statements**
3. Identify valid and invalid **arguments**
4. Prove elementary mathematical results using various **proof techniques**
5. Apply basic tools for **counting**
6. Solve **linear recurrence relations**
7. Identify two equal **sets** and provide justification that these sets are equal
8. Manipulate **relations and functions** between sets
9. Apply basic techniques in **graph theory**



# Your Learning Roadmap

Elementary  
Number Theory



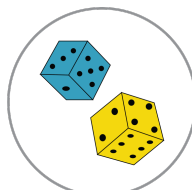
1

Predicate  
Logic



3

Combinatorics



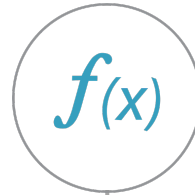
5

Set Theory



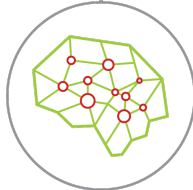
7

Functions



9

2



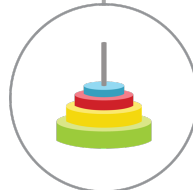
Propositional  
Logic

4



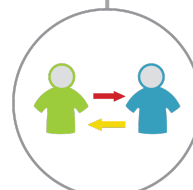
Proof  
Techniques

6



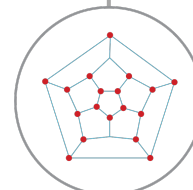
Linear  
Recurrence  
Theory

8



Relations

10



Graph  
Theory

# Assessment

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1. CA1 midterm test – 25% (Week 7)
2. CA2 midterm test – 25% (Week 11)
3. Final Exam – 50%

**Note: there will be no makeup tests for CA1 and CA2**

- A student who is absent from a CA without a valid Leave of Absence will be given **0 marks** for the missed CA.
- If you have a valid reason for absence, inform the lecturer **before the CA**. You will also need to notify your school and obtain a **Leave of Absence**. In such cases the weight for the CA will be transferred to the final exam.