



Inequalities (E2MAT002C)

Introduction	In mathematics, we may see problems involving inequalities everywhere. We use inequalities to find extreme values of functions, study properties of functions and prove mathematical theorems. In this course, we will discuss how to solve algebraic inequalities and inequalities involving absolute values. Then we study some important inequalities like AM-GM inequality and Cauchy-Schwarz inequality and their applications.	
Programme Type / Level	Algebra Course (Level II) (Token-required)	
Instructor(s)	Dr Lau Chi Hin Lecturer, Department of Mathematics, Chinese University of Hong Kong.	
Pre-requisites	Students should have the basic knowledge in: 1. solving linear inequalities; 2. solving simultaneous equations; 3. solving quadratic equations; 4. basic coordinate geometry.	
Target Participants	<ul style="list-style-type: none">➤ S1 – S3 HKAGE student members➤ Class size: 30 All applicants MUST attend the Screening Test held on 22 May 2021 This programme is the same as Algebra Course (Level 3): Inequalities (MATS2230) in 19/20 school year.	
Medium of Instruction	Cantonese with English handouts	
Certificate	E-Certificate will be awarded to participants who have: ❖ Attended at least 3 sessions AND ❖ Attained satisfactory performance in all assessments	
Intended Learning Outcomes	Upon completion of the programme, participants should be able to: 1. use algebraic and geometric methods in solving inequalities; 2. solve inequalities involving absolute value by case study; 3. state and prove AM-GM inequality and Cauchy-Schwarz inequality; 4. apply AM-GM inequality and Cauchy-Schwarz inequality to solve mathematical problem.	
Application Deadline	17 May 2021 12:00 n.n.	Application Result Release Date 28 May 2021
If student members withdraw from the programme after the Application Deadline, the token will be deducted.		

Schedule

Session	Date	Time	Venue (HKAGE)
Screening Test	22 May	2:00 p.m. – 3:30 p.m.	Room 105
1	13 Jul	2:00 p.m. – 5:00 p.m.	Room 303
2	15 Jul		
3	17 Jul		
4	20 Jul		

Remarks:

For any assessment to be held in the programme, no make-up will be arranged, including the screening test.

Sample Notes

1. Suppose $a > b$. State the conditions for the following inequalities to hold:

(a) $a^2 > b^2$

(b) $\frac{1}{a} < \frac{1}{b}$

2. Solve the following inequalities

(a) $\frac{2x-5}{x+4} \leq 1$

(b) $x^2 - 5|x| + 4 > 0$

3. Let a, b, c be positive real numbers. Prove that

$$\sqrt[3]{abc} \leq \frac{a+b+c}{3}$$

Enquiries

For enquiries, please contact Academic Programme Development Division on 3940 0101 after language selection, press "1".