

Mathematics and Games -

Critical Thinking and Problem-Solving (CD00051819)

Introduction

The course is organized under the Talents, Aspiration and Excellence (TAE) Programme of City University of Hong Kong to nurture gifted secondary school students to prepare for university education: <http://www.cityu.edu.hk/nurturetalent/index.html>.

Mathematics is a game! This course teaches you a variety of games played at American math circles, the popular Julia Robinson Mathematics Festivals (www.jrmf.org) and the Celebration of Mind (www.celebrationofmind.org). Starting from simple mathematical games, the course teaches students of any abilities to learn and appreciate the advanced mathematics behind these games and logic puzzles using critical thinking and problem solving skills. Students will also learn computational thinking and artificial intelligence ideas in seeing how computer science revolutionizes these mathematical games. In our previous offering, students learn how to program an AI Chatbot to play mathematical games!

The session will cover the following topics:

- Mathematical games involving abstract algebra
- Problem solving skills related to number systems and number theory
- Games involving algebra and graph theory
- Games involving combinatorics
- Artificial Intelligence and Computer Science Challenges

This programme is co-organized by the HKAGE and City University of Hong Kong (CityU). A support session conducted by the Affective Education Division (HKAGE) will also be included in the orientation session of this workshop.

Programme Type / Level

Introductory Workshop in Mathematics ([Token-required](#))

Instructor(s)

Dr. Tan Chee Wei

Associate Professor, Department of Computer Science, City University of Hong Kong

Dr TAN Chee Wei received the M.A. and Ph.D. degrees from Princeton University. He is the Director of the Julia Robinson Mathematics Festival in Hong Kong. His research interests include personalised learning technologies, computer science education and mathematics. Dr Tan's Erdős number is 3.

Target Participants



S1 – S4 HKAGE student members in 2018-19 academic year only

Capacity: 20

* *First-come, first-served. If student members apply for more than one programmes co-organised by the HKAGE and CityU (i.e. Mathematics and Games - Critical Thinking and Problem-Solving (CD00051819), Introduction to Stop Motion Animation (CD00061819) and Living Newspapers – Exploring Environmental Questions Through Drama (CD00071819), they may be accepted for one programme only.*

Medium of Instruction



English with English handouts (AE support session will be in Cantonese)

Certificate



1. **Certificate of Completion** will be issued by the City University of Hong Kong AND
2. **E-Certificate of Attendance** will be issued by the HKAGE to participants who have:
 - ❖ Attended **ALL sessions**; AND
 - ❖ Completed all the assignments with **satisfactory performance**

Intended Learning Outcomes



Upon completion of the programme, participants should be able to:

1. Understand mathematical games and their optimal solution
2. State at least one real-life application related to popular mathematical games.
3. Explain the given mathematical games and puzzles in their own words
4. Construct and critique strategies on solving the puzzles collaboratively in teamwork
5. Understand fundamental computer science and artificial intelligence knowledge in games

Application Deadline

11 Mar 2019

Application Result Release Date 15 Mar 2019

Student members may withdraw from the course on or before the deadline. Otherwise, the token will be deducted.

Schedule



Session	Date	Time	Venue	Remark
1	30 Mar	10:00 a.m. – 12:00 nn	Connie Fan Multi-media Conference Room, Floor 4, Cheng Yick-chi Building, City University of Hong Kong*	Orientation Session
2	26 Apr	4:00 p.m. – 7:00 p.m.	Peter Ho Lecture Theatre (LT-10), Floor 4, Yeung Kin Man Academic Building, City University of Hong Kong#	Lecture 1
3	27 Apr	9:00 a.m. – 12:00 nn	Chan Kei Biu Lecture Theatre (LT-6), Floor 4, Yeung Kin Man Academic Building, City University of Hong Kong#	Lecture 2

*Tat Chee Avenue, Kowloon, Hong Kong ([Map](#))

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Enquiries



For enquiries, please contact us at 3940 0101. After language selection, press “1”