香 港 資 優 教 育 學 苑
The Hong Kong Academy for Gifted Education

ADVANCED COUNTING TECHNIQUE (MATS3510)

Introduction	Counting is one of the very first topics in mathematics that one will encounter. While elementary counting problems are easy, sometimes we may also encounter complicated counting problems, e.g. In how many different ways can we choose 5 numbers from 1 to 1000? What if no two chosen integers are allowed to be consecutive? What if we further require no two chosen integers contain the same digit?
Programme Type / Level	Discrete Math, Probability, Statistics Course (Level 4) (Token-required)
Instructor(s)	Dr. Lau Chi Hin
Target Participants	➢ S4 – S6 HKAGE student members ➢ Class size: 30 **1st batch:** All applicants **MUST ATTEND** a screening test held on **27 May 2017** in HKAGE. **2nd batch:** All applicants **MUST ATTEND** a screening test held on **3 Jul 2017** in HKAGE
Pre-requisites	No special prerequisites are needed.
Medium of Instruction	English with English handouts
Certificate	**E-Certificate** will be awarded to participants who have: ❖ Attended **at least 5 sessions AND** ❖ Attained **satisfactory performance** in all assessments
Intended Learning Outcomes	Upon completion of the programme, participants should be able to: 1. List and compare different counting methods; 2. Apply basic counting models to solve various counting problems; 3. Apply the method of characteristic equations to compute the general terms of some sequences; 4. Apply the method of generating functions to solve various counting problems; 5. Solve various counting problems in real life by using the techniques learned in the course.
Screening	The screening test is designed to help the applicant understands the course level and the course content. Selection is based on students' performance in answering the question. Only students who can demonstrate motivation and the basic knowledge of Counting in the screening question can be enrolled in the programme.

Application Deadline	**1st batch: 22 May 2017** **2nd batch: 29 Jun 2017**	**Application Result Release Date**	**1st batch: 9 Jun 2017** **2nd batch: 5 Jul 2017**

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

Schedule

Session	Date	Time	Venue
1st batch Screening	**27 May**	**9:30 a.m. – 11:00 a.m.**	**Room 303** (HKAGE)
2nd batch Screening	**3 Jul**	**3:00 p.m. – 4:30 p.m.**	**Room 204** (HKAGE)
1	17 Jul	2:00 p.m. – 5:00 p.m.	Classroom 28, Buddhist Kok Kwong Secondary School
2	18 Jul		Room 303 (HKAGE)
3	20 Jul		Room 303 (HKAGE)
4	21 Jul		Classroom 28, Buddhist Kok Kwong Secondary School
5	24 Jul		Classroom 28, Buddhist Kok Kwong Secondary School
6	25 Jul		Room 303 (HKAGE)
7	27 Jul		Room 303 (HKAGE)

Remarks: For any assessment to be held in the programme, no make-up will be arranged.

Sample Examples for the Programme

1. How many rectangles are there on an 8 times 8 chessboard?
2. How many possible ways are there to arrange 4 boys and 5 girls to sit at a round table so that no two boys may sit next to each other?
3. How many possible ways are there to buy 8 drinks from 6 different kinds of drinks?
4. How many possible ways are to paint 6 different colors on the 6 faces of a regular cube so that no two faces are of the same color?

Enquiries

For enquiries, please contact us at 3940 0176 or 3940 0102.