

Gifted Education Fund: Off-school Advanced Learning Programmes

Programme No. 2021-05 (For secondary students)

Title of Programme	Mathematical Exploration and Modelling for Gifted Students in Hong Kong Junior Secondary Schools
Programme Provider	Department of Mathematics and Information Technology, The Education University of Hong Kong
Theme	STEM-related Mentorship Programme
Maximum No. of Participants and Class Level in the 2021/22 School Year	25 students (Secondary 2-3)
Pre-requisite	Applicants should demonstrate outstanding performance and aptitude in Mathematics in schools and show an interest in computer programming.
Programme Delivery Period	From June 2022 to March 2023 (10 months) (tentative)
Medium of Instruction	Course Material: English Class teaching/ Discussion: English supplemented with Cantonese
Objectives	• To promote accelerated learning of Mathematics among gifted students at junior secondary level and enhance their knowledge and skills in major mathematics topics such as Algebra, Geometry, Calculus, Probability and Statistics; • To deepen the students' understanding of the use of modelling, simulations and programming in solving complicated mathematical problems via hands-on and minds-on research and exploration under mentorship of academics/ educators; and • To nurture positive values and attitudes among students such as perseverance, empathy, willingness to share and collaborate with people, etc.
Programme Outline*	This programme promotes accelerated learning of Mathematics and introduces several more advanced topics of Mathematics to junior secondary students. Students will engage in research and exploration, and learn to use modelling, simulations and programming to solve complicated mathematical problems. Apart from enhancing the knowledge and skills, and developing a strong mathematical foundation among the students, the programme will also help to nurture positive values and attitudes essential for personal growth and development of the students. The programme consists of two phases. Phase I: Foundation part (40 hours in total) • This part will help students develop a solid foundation in mathematics and prepare them for the next phase of the

	programme. Topics covered includes: (1) Algebra with an emphasis on functions and inequalities; (2) Euclidean Geometry with focus on 2D and 3D figures; (3) Probability and Statistics; and (4) Use of GeoGebra, a free online mathematical tool and relevant programming techniques. - Besides class teaching, ample opportunities will be arranged for students to engage in exploratory hands-on activities. For some specific topics, students may go through the process of guided reinvention and develop a mathematical concept or result under supervision. Phase II: Extended part (13 hours in total) - This phase will consist of lessons and regular meetings with mentors for advice and guidance on research/ exploration. - The following 5 topics/ modules are available for research/ exploration by the students: (1) Calculus and modelling via exploration; (2) Shape and space: mathematical modelling with GeoGebra; (3) Making geometric models by paper-folding; (4) Data handling: simulations with GeoGebra; and (5) Euclidean geometry through hands-on exploration. - To facilitate students' selection of the topic/ module for in-depth enquiry, lessons will first be arranged to provide an overview of the 5 topics/ modules. - Students will submit a report and present their work in a showcase event by the end of this phase. Parents, teachers and other guests may be invited to attend the event. * In view of the latest development of the COVID-19 pandemic, the programme provider may need to modify the learning and teaching activities as a contingency.
Admission Fee	Free of charge
Application Method	Application form can be downloaded from the following webpage: https://www.edb.gov.hk/en/curriculum-development/curriculum-area/gifted/ge_fund/gef/osalp.html  Please complete the application form and send it by post <u>on or before 16 May 2022</u> to the following address: Department of Mathematics and Information Technology D4-1/F-19A The Education University of Hong Kong 10 Lo Ping Road, Tai Po (Attn: Miss Peggy MA)
Documents to be	A photocopy of report card (from Secondary One onwards)

Submitted along with the Application	
Enquiry	Miss Peggy MA (Project Officer, The Education University of Hong Kong) Tel No.: 2948 8549 Email: psma@eduhk.hk
Date of Announcement of Result	By late May 2022 (tentative)