Gifted Education Fund: Off-school Advanced Learning Programmes

Programme No. 2020-01 (For secondary students)

Title of Programme	**Big Energy Data Collection and Analysis of Domestic Electric Energy Consumption**
Programme Provider	Department of Physics, Hong Kong Baptist University
Theme	STEM-related Mentorship Programme
Maximum No. of Participants and Class Level in the 2020/21 School Year	20 students (Secondary 4-5)
Pre-requisite	• Applicants should possess basic knowledge in app development and using mathematics software in coding; • Parents/ Guardians of applicants should agree to allow a qualified electrician arranged by the programme provider to install a smart energy meter at home. The energy consumption data recorded by the meter will be shared with other students anonymously. The meter will be removed by a qualified electrician at the end of the programme.
Programme Duration	About 8 months
Medium of Instruction	Course Material: English Class teaching/ Discussion: English supplemented with Cantonese
Objectives	• To enrich the knowledge of students in smart cities, Internet of Things (IoT) and efficient use of energy through authentic research of domestic electric energy consumption; • To enhance the skills of students in coding through developing a mobile application to monitor household electric energy consumption and other environmental data such as the temperature; • To equip students with first-hand experiences in big energy data retrieval, analysis and interpretation with a view to strengthening their problem-solving capability; and • To nurture positive values and attitudes among the students

Programme Outline*	This programme aims to enhance gifted students' knowledge, skills, and values and attitudes through engaging them in authentic big energy data research studies. The programme consists of four phases.
	
	Phase I
	• 2 lectures (3 hours each) on theories and demonstrations related to:
	  - the key components of smart cities;
	  - sensor operation principles and applications for smart cities;

	and - innovation technologies for development of green and smart cities **Phase II** - Installation of a smart energy meter by qualified electricians at each student's household and trial use of a mobile application by students to monitor the electric energy consumption at home. **Phase III** - 5 laboratory sessions (3 hours each; two classes with 10 students each) on the development of a mobile application by each student for the acquisition of meteorological/ weather information from the Internet as well as measurement and collection of data related to the students' own household consumption of electric energy. **Phase IV** - 6 laboratory sessions (3 hours each; two classes with 10 students each) on big energy data retrieval, analysis and integration by using appropriate mathematical tools; - Students will investigate and suggest energy saving strategies based on the results of data analysis. * In view of the COVID-19 epidemic, some sessions of the programme may be conducted online.
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 15 April 2021</u> (now extended to 30 April) to the following address: Department of Physics 9/F, Cha Chi-ming Science Tower Ho Sin Hang Campus Hong Kong Baptist University 224 Waterloo Road Kowloon Tong (Attn: Dr CHAN Mau-hing)
Documents to be Submitted along with the Application	- Record of participation in training courses on mobile application development and computer programming (if any)
Enquiry	Dr CHAN Mau-hing (Department of Physics, Hong Kong Baptist University)

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Date of Announcement of Result	By May 2021 (tentative)