Gifted Education Fund: Off-school Advanced Learning Programmes

Programme No. 2020-09 (For secondary students)

Title of Programme	**Learn Microfluidics with Fun**
Programme Provider	Department of Biomedical Engineering, City University of Hong Kong
Theme	STEM-related Mentorship Programme
Maximum No. of Participants and Class Level in the 2020/21 School Year	3 students (Secondary 4-5)
Pre-requisite	No special background knowledge or skills are required.
Programme Duration	About 15 months
Medium of Instruction	Course Material: English Class teaching/ Discussion: English supplemented with Cantonese
Objectives	• To enrich gifted students' knowledge of microfluidics and microfabrication, and also relevant applications; • To equip students with the skills of using a computer-aided design (CAD) software to design and simulate a microfluidic gradient generator; • To provide opportunities for students to propose their microfluidic designs and prototype their devices, and acquire authentic research experience in the laboratory of the university; • To motivate the students and enhance their ability to discover, create and innovate as well as strengthen their problem-solving capability through student-led learning; and • To nurture positive values and attitudes of the students to cope with adversities and make good use of science and technology to benefit the people
Programme Outline*	This programme aims to enhance gifted students' knowledge and skills in microfluidics and microfabrication through engaging them in the design, fabrication, prototyping and development of their own microfluidic devices. The programme will also nurture positive values and attitudes among the students such as perseverance and caring for people through the learning process. The programme consists of five phases. Phase I • 4 lectures (3 hours each) on the following topics: - microfluidic and micro/ nanofabrication principles; - use of AutoCAD® and MATLAB® for simulation of designs

	Phase II • Independent project (weekly meetings). Students will design their own micromixer by applying micro and nanotechnology principles under guidance. Phase III • Hands-on workshops on device fabrication (a 3-hour session per week). Students will perform experiments in laboratories on photolithography, soft lithography and device assembly, and produce written reports. Phase IV • Hands-on workshop on device validation (a 3-hour session per week). Students will perform experiments in laboratories on the flow characterisation of the device, evaluation of device performance, immunostaining of cells and microscopy, and produce written reports. Phase V • A conference for students to report and showcase their designs and results obtained in the projects * 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 on or before 15 April 2021 (now extended to 30 April) to the following address: Department of Biomedical Engineering City University of Hong Kong Tat Chee Avenue Kowloon Tong (Attn: Dr KHOO Bee Luan)
Documents to be Submitted along with the Application	• Evidence of Other Learning Experiences (if any)
Enquiry	Dr KHOO Bee Luan (Department of Biomedical Engineering, City University of Hong Kong) Tel No.: 3442 9423 Email: blkhoo@cityu.edu.hk

Date of Announcement of Result	By May 2021 (tentative)