

**DEPARTMENT OF BIOLOGY**  
**GCAP3046 GE Capstone Interdisciplinary Study (BIOL)**  
**List of Project Topics for Semester 2 of 2020-21**

Project Supervisor	Email address	Project Topic	Project Description
Prof. Wong, Jonathan Woon Chung	jwong@hkbu.edu.hk	Develop Means to Increase the Usage of Recycling Stations	In Hong Kong the waste reduction rate is only around 39% which is comparatively lower than many other cities in the world. Recently the Environmental Protection Department has recently established 22 new recycling stores in various districts in Hong Kong with the purpose to increase recycling capability in local communities. The effective running of these stations will significantly affect local recycling rate. Students participating in this study will carry out a survey on the usage and operation of these stations. The group of students will then engage one station to give a deep analysis on their operations and will develop an improvement programme for this specific station to engage the local community to increase their usage of the recycling station.
Prof. Qiu, Jianwen	qiuwjw@hkbu.edu.hk	Coral and community connections	Five students will form a team to address the following issues: 1, public awareness of coral reefs (questionnaire); 2, Coral biology education in primary and high schools (research on local and overseas curricula); 3, Public contact with coral ecosystems (questionnaire); 4, Economic values of corals (questionnaire); 5, Coral protection policies (questionnaire).
Prof. Xia, Yiji	yxia@hkbu.edu.hk	Urban Agriculture and Community Gardening in Hong Kong: A Feasibility Study	In this project, students will examine scientific, environmental, social, economic, and public health factors to assess the potential of developing urban agriculture and community gardening in Hong Kong. Students will identify challenges, opportunities, requirements for realization of urban farms in Hong Kong.
Prof. Xiong, Liming	lxiong@hkbu.edu.hk	Feasibility to establish more community gardens using vacant government land	Roles of community gardens (particularly for the elderly); Current community gardens in HK; Current vacant government land; distribution of elderly homes/care centers and vacant government land (one district as an example); proposal on site selection, garden layout, selection of vegetables, supplies, waste treatment, cost, and management; potential environmental, aesthetic, and social impacts etc.
Prof. Mak, Nai Ki	nkmak@hkbu.edu.hk	Myths and facts about immunization (vaccination)	According to the World Health Organization, reluctance to vaccinate is one of the top ten health issues in 2019. Misunderstanding and spreading of misinformation (e.g. from social media) about immunization may pose a dire threat to general public. Student taking this project is expected to find out the myths and facts of immunization.
Prof. Yung, Ken Kin Lam	kklyung@hkbu.edu.hk	Psychological situations under the Pandemic	Covid-19 Pandemic has resulted in quarantine and isolations of a majority of World population. The isolations and lock downs of cities have created a lot of stress and psychological conditions in many people. The present study should investigate the types of psychological situations of the people and discuss and suggest possible interdisciplinary solutions to minimize the conditions. Internet/library search/zoom discussion should be performed.
Prof. Zhao, Zhongying	zyzhao@hkbu.edu.hk	Identification of hybrid incompatible genes between closely related nematode species	Systematic characterization of hybrid incompatibility (HI) between related species remains the key to understanding speciation. The genetic basis of HI has been intensively studied in Drosophila species, but remains largely unknown in other species, including nematodes, which is mainly due to the lack of a sister species with which <i>C. elegans</i> can mate and produce viable progeny. The recent discovery of a <i>C. briggsae</i> sister species, <i>C. nigoni</i> , has opened up the possibility of dissecting the genetic basis of HI in nematode species. To elucidate the genetic basis of speciation in nematode species, we previously generated 96 chromosomally integrated GFP markers in the <i>C. briggsae</i> genome and mapped them into the defined locations by PCR and Next-Generation Sequencing (NGS). This project aims to identify the hybrid incompatible genes between <i>C. briggsae</i> and <i>C. nigoni</i> .
Dr. Chiu, Jill Man Ying	jillchiu@hkbu.edu.hk	Does nature really makes us happy?	Students will need to conduct a literature review on the topic and then design and administer a questionnaire-based survey to understand how nature increases our happiness and well-being levels and affects our behavior. As a group, students will come up with a standardized measurement of happiness level. Each student will have his/her own specific research questions (or a set of questions) covering a topic that he/she likes the most. For instance, a student interested in physical activity can test whether physical activity in nature in comparison to indoor environments is related to a higher level of enjoyment, so people exercise in nature for longer periods and more often when compared with indoors.

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Dr. Cheung, Allen Ka Loon	akcheung@hkbu.edu.hk	Can we use the pseudovirus model for SARS-CoV-2 to test the effectiveness of antiviral agents and devices?	SARS-CoV-2 is an airborne contagious virus that is highly transmissible and requires biological safety level 3+ for conducting research for its pathogenicity and vaccine protection. However, for the community, antiviral agents and devices are urgently needed and testing may turn to the use of pseudovirus model. This topic explore whether pseudovirus can be used to mimic real SARS-CoV-2.
Dr. Kim, Pan-Jun	panjunkim@hkbu.edu.hk	Rigorous assessment of claimed health benefits of market-available probiotics	There are many commercially available probiotics products in market, but it is unclear whether the health benefits of these products advertised by the companies are actually based on scientific evidence. Through the literature search of published papers on these probiotics, we will assess which health benefits do have a rigorous scientific basis. The research results will be shared with the public for better use of the probiotics.
Dr. Kim, Pan-Jun	panjunkim@hkbu.edu.hk	Website system construction for personalized food recommendation	~Preferred students: computer science background or previous experience in website or database construction. ~ Food recommendation for individual people is important to promote health. We will construct website system for personalized food recommendation open to the use of the public.
Dr. Pradhan, Nirakar	npradhan@hkbu.edu.hk	Vertical farming: A solution for sustainable food production in urban areas with a special focus on Hong Kong	Both the population growth and demand for food in urban areas are expected to rise significantly in the coming years. Vertical farming concepts can be applied in urban areas to maximize food production and offset demand. The vertical farming concept is lucrative as the interior environmental conditions can be precisely controlled for the optimal growth of plant growth throughout the year. The vertical farming concept has been tested successfully in many urban areas around the world. In this project, we will study the various veracious vertical farms (including types of plants grown, their productivity, basic input cost, and resource utilization) around the world and suggest measures how it can be applied in Hong Kong.
Dr. Law, Michelle Man Suet	lawmichelle@hkbu.edu.hk	Promoting Soil Biodiversity Education in Hong Kong	Educating the youths and the general public to learn about the biodiversity is a key to promote and conserve the variability among living organisms in Hong Kong, as well as their contribution to our ecosystems. Yet, the biodiversity education should go beyond the surface and emphasize the importance of holistic soil ecosystem and biodiversity. Students are expected to participate in a community-based biodiversity education programme on soil biodiversity, and evaluate the significance of environmental education elements and the learning outcomes of the programme.
Dr. Leung, Anna Oi Wah	aleung@hkbu.edu.hk	Challenges in Agriculture in Hong Kong	The farming of vegetables in Hong Kong is gaining more interest in the past years to meet the public's demand for the consumption of locally-grown, organic vegetables that are free of chemicals, safe and nutritious. For this capstone project, students are required to investigate the major challenges faced by farmers in Hong Kong and provide suggestions on how they may overcome these challenges.
Dr. Wu, Haoxiang	wuhaoxiang@hkbu.edu.hk	Healthy campus – what and how	Under this COVID-19 pandemic situation, various infection control measures have already been implemented in our campus. These measures include but not limited to the requirement of social distancing, frequent disinfection/cleaning, mask-wearing policies, application of antimicrobial coatings, etc. However, from time to time, people in campus may not fully follow these requirements; e.g., 1.5 m social distancing is easy to be ignored and sometimes we may not even be aware of this because not all of us have formed the habit of keeping distance from others. In order to maintain a healthy campus, it is important to ensure all the campus users strictly follow the infection control measures, and thus everyone in campus should be fully aware of all these measures. Given this, the topic involves the investigations into campus users' (including staff members and students) understandings in the currently adopted infection control measures. In addition, campus users' satisfaction and the effectiveness of these measures will also be evaluated and reviewed.

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Dr. Yue, Patrick Ying Kit	patrick@hkbu.edu.hk	Anti-pandemic items: how much you know?	The spread of COVID-19 has caught the world by surprise since December 2019. Throughout the year, people trying to search and use different forms and types of anti-pandemic items for their personal protection. Meanwhile, a lot of new technologies and ideas have been applied for the R&D of anti-pandemic items. Indeed, how much we know about these items? What are the working mechanisms and technologies lied behind? In this project, you will be instructed to overview the anti-pandemic items available in the markets.