Master of Science in the field of

Food Safety and Toxicology

Apply now for entry in September 2020

THE UNIVERSITY OF HONG KONG
FACULTY OF SCIENCE

Established by the School of Biological Sciences in 2009, the MSc in the field of Food Safety and Toxicology programme aims to provide a comprehensive training on a multi-disciplinary field involving general toxicology, food toxicology, regulatory toxicology, and food safety management. The distinctive feature of this toxicology programme is its focus on food safety perspectives. It emphasizes on basic knowledge as well as practical skills in recognition and evaluation of human exposure to potentially hazardous chemicals and pathogens, in our living environment and via dietary intake of foods. Special reference will be made to food safety evaluation and regulation.

Admission in September 2020

Features:

- A multi-disciplinary programme extending over two years of part-time$^{\Delta}$ study or one year of full-time study
- First postgraduate Toxicology programme of its kind designed to address specifically on food safety
- Focused on general principles of toxicology, chemical and microbial hazards in food, toxicity evaluation, exposure assessment, risk assessment and risk management
- Taught by a teaching team with considerable experience in the fields of policy development, law enforcement, and research and consultancy for industry and government
- Internationally renowned visiting lecturers to give lectures and workshops

Programme Structure

$^{\Delta}$ Part-time two years study

First Year – Core courses (39 credits)

FSTX7001 Principles of toxicology I (9 credits)
FSTX7002 Principles of toxicology II (9 credits)
FSTX7003 Toxicity tests and hazards evaluation methods (9 credits)
FSTX7004 Regulatory toxicology: risk assessment, risk management and communication (12 credits)

Second Year – Core courses (30 credits)

FSTX8005 Chemical and microbial hazards in food (9 credits)
FSTX8006 Food safety management (9 credits)
FSTX8007 Project (12 credits)

Full-time one year study

To complete all the core courses listed above.

Δ Part-time not offered in 2020-21

Course Contents

FSTX7001 Principles of toxicology I (9 credits)

Coordinator: Dr Hani S El-Nezami

This module introduces students to the general principles and practice of toxicology. The major focus of the course is on basic principles, mechanisms and common methods underpinning the science of toxicology. Selected target organ systems (e.g. respiratory, nervous and immune systems) are studied with respect to understanding how representative chemicals damage and impair their ability to function. Students will develop a fundamental understanding of how chemicals may exert toxic effects and gain insight into the importance of organ-specific toxicity.

Assessment: Course work (25%); Examination (75%)

FSTX7002 Principles of toxicology II (9 credits)

Coordinator: Dr Hani S El-Nezami

This module continues to introduce students to the general principles and practice of toxicology. The course continues to focus on basic principles, mechanisms and common methods underpinning the science of toxicology. Selected toxicants are studied with respect to their source of exposure and mechanisms of effects. Selected disease processes (e.g. mutagenesis, carcinogenesis, reproductive toxicity, teratogenesis and developmental toxicity) are studied with respect to understanding their basic pathways and common mechanisms. Selected fields are presented to give students insight into the applications of toxicology and its relationship with other fields.

Assessment: Examination (100%)

FSTX7003 Toxicity tests and hazards evaluation methods (9 credits)

Coordinator: Dr Stephanie W Y Ma

This module will provide students with the current state-of-the-art methodology employed to investigate the effect of chemical and microbial toxins and environmental pollutants on living systems. Topics include exposure estimate, animal tests for acute toxicity, short-term and long-term toxicity, for mutagenicity, genotoxicity and carcinogenicity, for reproductive toxicity, teratogenicity, developmental toxicity and delayed neurotoxicity. Major focus is on the basic principles underpinning each test method including the test rationale, protocol design, limitations and data interpretation. Students will also be introduced to the basic concepts of toxicological evaluation and criteria for setting guidance values for dietary and non-dietary exposure to chemicals. The role of biochemical, metabolic and toxicokinetic studies in toxicological evaluation is also considered.

Assessment: Course work (20%); Examination (80%)

FSTX7004 Regulatory toxicology: risk assessment, risk management and communication (12 credits)

Coordinator: Dr Stephanie W Y Ma

In order to fully appreciate risks that arise from human exposure to chemicals in our living environment, it is essential to quantify levels of chemical contamination in environmental media and foods, and estimate total chemical exposure from dietary and non-dietary sources. This module will provide students with intensive training to develop the necessary practical skills to measure and model the extent to which human populations come into contact with toxic agents in the environment and foods, to conduct qualitative and quantitative risk assessments, to set safe levels of chemical exposure in foods (based on local food consumption patterns), and to implement effective risk management in protecting human health and the environment. The roles of international food safety authorities such as WHO, FAO, Codex Alimentarius Commission, JECFA, IARC and OECD will be described. Introduction to local and international food laws will be provided.

Assessment: Course work (25%); Examination (75%)

Introduction to Hong Kong, Mainland China and international food laws will be provided.

FSTX8005 Chemical and microbial hazards in food (9 credits)

Coordinator: Dr Hani S El-Nezami

This module will introduce students to the chemical and microbial hazards in food and their effects on human health. Special reference is made to heavy metals, pesticides, food additives, persistent organic pollutants and natural food contaminants of current public concern. An emphasis will also be placed on developing the understanding of the actual impact of food and waterborne pathogens, their epidemiology and factors contributing to the increase in their incidence. Determination of exposure pathways and linking food hazards to human health is the primary focus. Topics include: contamination monitoring, quantification of exposure at the individual level, interactive effects of exposure to multiple risk factors, perceptions of risk and integration of laboratory science with population-based studies.

Assessment: Course work (20%); Examination (80%)

FSTX8006 Food safety management (9 credits)

Coordinator: Professor C Y Ma

Good manufacturing practice has a significant impact on the daily operation of a food processing facility. Quality products and a safe work place are important components of a good company. This course will focus on issues arising from GMP and aspects of the physical design of a food processing facility which impact the safety of workers and products. In food supply chain, traceability is the ability to follow the movement of a food product through the stages of production, processing, and distribution, and is an important component of the food safety management system. As a core quality management tool in the food industry, the relevance, impact and use of ISO 22000 and HACCP in manufacturing and catering will be discussed. Topics covered will include the international/national HACCP standards, and designing safety into food products and processes as well as the practical development and implementation of a HACCP Plan using local and Asian case studies.

Assessment: Course work (15%); Examination (85%)

FSTX8007 Project (12 credits)

Coordinator: Professor C Y Ma

All students are required to undertake or to attend training (up to maximum 6 months) in one of the following areas:

- Academic institutions, to carry out basic research project using the most advanced techniques in molecular biology, analytical chemistry and biomedical sciences.
- Food, chemical and pharmaceutical industries, to overlook industry procedures on ensuring that the emerging/ newly developed food and chemical products meet regulatory standards and requirements and are safe for consumers; their potential health implications, and
- Government agencies, to gain knowledge on the procedures implemented by the local/national authorities in formulating science-based policies, laws and regulations to ensure the safe production and use of food and chemicals.

The candidate shall make a formal presentation on the subject of his training during the final semester of the teaching programme.

Assessment: Project (100%)

Programme Duration and Class Schedules

Each 9-credit course is an intensive workshop offered over two weeks, consisting about 40 contact hours. Preceded by preparatory study of carefully-selected distance-learning material and followed by consolidation and assessment, each course is self-contained and is individually assessed.

Target Students

Students are expected to have basic knowledge in physiology, biochemistry, chemistry or molecular biology for understanding the topics covered in the programme. The programme is intended for those with relevant experience in the food, chemical, pharmaceutical and public health sectors, including but not limited to:

- supervisory positions in the above industries or consultancy;
- environmental, food and health officers, technical officers in local/national regulatory authorities;
- officers in diagnostic or analytical laboratories; and
- graduates who completed relevant undergraduate degrees, looking for career opportunity in the above industries/government agencies.

Assessment

Written work forms an important part of the programme. All written and verbal communication is in English. Most courses in the programme are assessed by examination and by coursework. The project report will be assessed by examiners and participation in the seminars at which students present their work is one of the requirements for the completion of this component of the degree curriculum.

Tuition Fees

The composition fee for the full-time programme is HK$140,000# for 2020-21 intake and that for the part-time$^{\Delta}$ progamme is HK$70,000# per year for two years. The fee shall be payable in two instalments over one year for full-time study or in four instalments over two years for part-time$^{\Delta}$ study. In addition, students are required to pay Caution Money (HK$350, refundable on graduation subject to no claims being made) and Graduation Fee (HK$350).

 # Subject to approval

Δ Part-time not offered in 2020-21

Admission Requirements

A Bachelor's degree with Honours in science. Preference will be given to those who possess a Bachelor's degree in physiology, biochemistry, biotechnology, food science, chemistry, biological sciences, clinical laboratory science, environmental sciences, pharmacology or other related disciplines.

Application

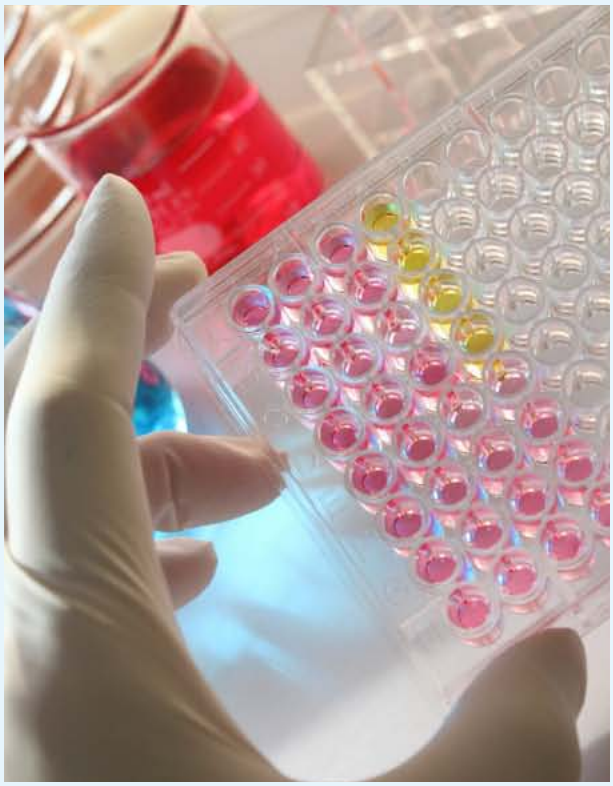
Application will be considered immediately until April 29, 2020.

Programme details:
https://aal.hku.hk/tpg/
https://www.scifac.hku.hk/prospective/tpg/about

Online application:
https://aal.hku.hk/tpg/

Enquiries

School of Biological Sciences
The University of Hong Kong
Tel: 2299 0802 Email: biotpg@hku.hk



Programme Director

Dr Hani S El-Nezami

BSc (Alexandria University, Egypt),
MAppSc, PhD (RMIT-University, Australia)

Tel: 2299 0835 Email: elnezami@hku.hk

Programme Manager

Dr Stephanie W Y Ma

BSc, MSc(HK); PhD (Br Col)

Tel: 2299 0353 Email: swyma@hku.hk

Course Coordinators

Dr Hani S El-Nezami

Associate Professor, School of Biological Sciences
BSc (Alexandria University, Egypt), MAppSc, PhD (RMIT-University, Australia)

After obtaining his PhD in Applied and Nutritional Toxicology from RMIT-University, Melbourne, Australia, Dr El-Nezami moved to the University of Kuopio, Finland, where he established a research programme investigating human exposure to food toxins with special focus on mycotoxins in developing countries. The programme later extended to investigate dietary approaches to counteract the health hazards associated with exposure to food toxins. In recognition of his research excellence Dr El-Nezami was awarded the prestigious Academy of Finland Fellowship. In 2008, Dr El-Nezami joined the School of Biological Sciences of The University of Hong Kong.

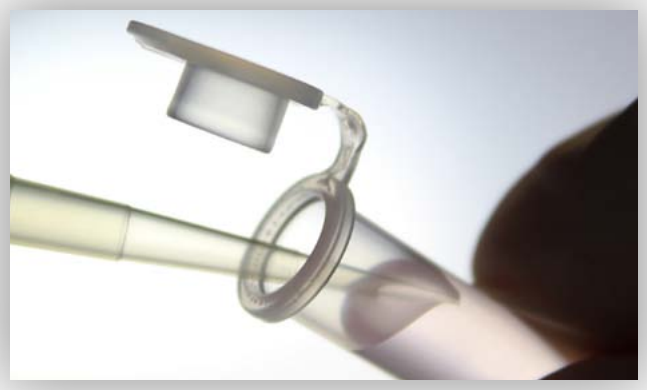
Dr El-Nezami holds an adjunct Professor post at the University of Turku, Finland, and Misr University for Science and Technology, Egypt. Dr El-Nezami is the Assistant Coordinator of consortium (9 EU countries plus China and Hong Kong) funded by the European Union aiming at the modernization of Traditional Chinese Medicine. Being an active member of the Finnish Society of Toxicology, Eurotox, and the American Society of Microbiology, Dr El-Nezami serves as consultants for several firms in Finland and Egypt.

Professor C Y Ma

Lecturer, School of Biological Sciences
BSc, MSc (HK); MSc, PhD (Br Col)

Professor Ma worked as a Research Scientist in the Food Research Centre, Agriculture Canada for over 15 years before returning to Hong Kong in 1996. He has extensive experience in conducting applied research in food science and technology, and has been a consultant to many food companies in North America and Hong Kong. Professor Ma teaches undergraduate courses in Food and Nutritional Science Programmes.

Professor Ma has served as a member of many government consultative bodies including the Food and Environmental Hygiene Advisory Council and the Midwife Council, and as Standard Board Advisor to the Hong Kong Organic Resource Centre. He has served as the chairman of the HKSAR Expert Committee on Food Safety, and a member of the Panel on Promoting Testing and Certification Services in Food Trade, and also the Task Force on Food Safety Management System.



Dr Stephanie W Y Ma

Lecturer, School of Biological Sciences
BSc, MSc(HK); PhD (Br Col)

Dr Ma graduated with a PhD in Physiology from the Medical School, University of British Columbia, Canada. She worked as a Research Scientist at the National Research Council of Canada and a Senior Toxicologist at Health Canada for over 16 years, before returning to Hong Kong in 1996. Dr. Ma served as Senior Environmental Protection Officer of the Environmental Protection Department (1996-2008) and Senior Food Toxicologist of the Centre for Food Safety, Food and Environmental Hygiene Department (2008-2013) in the Hong Kong SAR Government. She has been an Honorary Associate Professor/Lecturer in the School of Biological Sciences.

Dr Ma has extensive experience in conducting research in chemical toxicology, in toxicological evaluation and safety assessment of chemicals to human health, and in policy development for the control and management of toxic chemicals. She has served as Advisor to various international Food Safety Organizations including the Joint Meeting of Pesticide Residues and the International Programme on Chemical Safety, WHO.

Overseas Guest Lecturers (2019-2020):

1. Professor David Kitts, University of British Columbia, Canada
2. Professor Risto Juvonen, University of Eastern Finland, Finland
3. Professor Roger Coulombe, Utah State University, USA
4. Professor Hannu Mykkanen, University of Eastern Finland, Finland
5. Professor Janna Rysä, University of Eastern Finland
6. Professor Wolfgang Kneifel, University of Natural Resources and Life Sciences, Austria
7. Dr. Peter Chan, Health Canada, Canada
8. Professor Hannu Raunio, University of Eastern Finland, Finland
9. Dr. Paul Turner, University of Maryland, USA
10. Professor Stephen Forsythe, Nottingham Trent University, UK
11. Professor Harri Alenius, Institute of Environmental Medicine, Karolinska Institutet, Sweden
12. Dr. Jenni Korhonen, University of Eastern Finland, Finland
13. Professor Kenneth Korach, National Institute of Health (NIH/NIEH), USA.
14. Dr. Chiranjeev Dash, Georgetown University, USA