

# Master of Science/ Postgraduate Diploma in Environmental Science and Management (EVSM) 2019-2020

SCIENCE



ENERGY



ENVIRONMENT



SUSTAINABILITY



CLIMATE CHANGE



MANAGEMENT



TECHNOLOGY



THE HONG KONG  
UNIVERSITY OF SCIENCE  
AND TECHNOLOGY



Division of  
Environment and  
Sustainability

## Introduction

The Hong Kong Special Administrative Region (HKSAR) has made the improvement of its environment a high priority to ensure sound future development. The Government has established mechanisms and agencies to support initiatives for promoting research, education and community programs in environmental protection. The Hong Kong University of Science and Technology (HKUST) is making significant contributions to these initiatives by innovative and relevant research and interdisciplinary postgraduate programs. The Master of Science (MSc) and Postgraduate Diploma (PGD) in Environmental Science and Management (EVSM) are unique programs that provide professional training for graduates to prepare themselves to deal with the rapidly developing environmental issues in Hong Kong and the world.

The multi-disciplinary programs encompass science, engineering and management courses. Students will not only be trained on advanced Environmental Science and Environmental Management courses, they will also have the unique opportunity to take several engineering electives to broaden their horizons.

In coping with the global trend on the demand for environmental management professionals, the Environmental Science and Management program was transformed from the Environmental Science program in 2010. The MSc/PGD in EVSM now provides a wealth of scientific, engineering and management courses to those who want to advance their career in environmental science and management.

## Objectives

- To strengthen student's professional status with updated and advanced knowledge and development in important and emerging environmental issues and concepts.
- To enhance student's ability in applying latest environmental concepts (technologies or management strategies) to local, regional and global environmental problems.
- To provide professional and interdisciplinary training for graduates to prepare themselves to tackle the rapidly developing environmental issues in Hong Kong and the surrounding region.
- To cultivate student's stewardship towards sustainable development in their professional industries and sectors.

## Program Duration

- MSc Degree: 1 - 1.5 years for full-time and 2.5 years for part-time study
- Postgraduate Diploma: 1 year for full-time and 1.5 years for part-time study



## Target Students

The program is designed for students in government positions, environmental consulting firms, secondary school teachers, or recently graduated undergraduates who wish to advance their knowledge and training in environmental science and management.

## Admission Requirements

Applicants for admission to the MSc or PGD in Environmental Science and Management Program should have a Bachelor degree with Second class honors or above.

## Program Schedule

- Full-time students should take a minimum of 9 credits and up to a maximum of 15 credits per semester.
- Part-time students are normally expected to take 6 to a maximum of 9 credits (excluding MSc project) per semester.

The nominal program fee only covers a registered study period of 3 semesters for the PGD program and a registered study period of 5 semesters for the MSc program. Students are required to pay HK\$4,000 per credit for additional course(s) taken beyond the nominal program requirement and HK\$2,000 per credit for auditing course(s).

All lectures will be given in the weekday evening from 7:00 p.m.–9:50 p.m. and Saturday morning at the Hong Kong University of Science and Technology (HKUST). Each 3-credit course includes three lecture hours per week, or in the case of 4-credit courses, three hours of lectures plus tutorial section(s).

## Credit Transfer

Credit transfer may be granted for **postgraduate courses** with satisfactory grades for appropriate environmental courses completed elsewhere. Application must be made to the Program Director during the first semester after admission. Upon the approval of the Program Director, a maximum of 9 credits can be transferred from other institutions to the MSc Program and a maximum of 6 credits to the Postgraduate Diploma Program.

## Program Transfer

Students in the PGD Program may apply for transfer to the MSc Program with the approval of the Program Director, and vice versa. Students must apply for the transfer at least one regular term prior to the completion of their program study.

## Accommodation Arrangement

Admission to the MSc/PGD program does not place the University under any obligation to arrange or to assign on-campus or off-campus accommodation to students. Students admitted to the program are required to arrange accommodation on their own.

## Graduation Requirements

Courses will be assessed according to the grading scheme used for postgraduate courses at HKUST. Students in the MSc or PGD Program must complete the program with a **graduation grade average (GGA) of 2.850 or above**, as required for all postgraduate students at HKUST.

## Tuition Fees

### *Master of Science (MSc) in EVSM Program HK\$120,000 (30 credits only)*

Installment	Deadline	Amount (HK\$)	
		Full-Time	Part-Time
Non-refundable deposit	To be paid upon offer is made	30,000	30,000
1st installment	To be paid in early Sep 2019	30,000	30,000
2nd installment	To be paid in early Feb 2020	60,000	30,000
3rd installment	To be paid in early Sep 2020	—	30,000

### *Postgraduate Diploma (PGD) in EVSM Program HK\$60,000 (15 credits only)*

Installment	Deadline	Amount (HK\$)	
		Full-Time	Part-Time
Non-refundable deposit	To be paid upon offer is made	15,000	15,000
1st installment	To be paid in early Sep 2019	15,000	15,000
2nd installment	To be paid in early Feb 2020	30,000	15,000
3rd installment	To be paid in early Sep 2020	—	15,000

Notes:

1. Any additional credits are not covered by the fees stipulated above.
2. Students admitted with credit transfer are also required to pay the nominal program fee.
3. Once the fee is paid, it is non-refundable.

## Program Structure and Curriculum

Master of Science (MSc) in Environmental Science and Management Program (30 credits)

- ▶ Minimum of 12 credits of foundation courses
- ▶ Up to 18 credits of electives, or electives plus MSc projects

Postgraduate Diploma (PGD) in Environmental Science and Management Program (15 credits)

- ▶ Minimum of 6 credits of foundation courses
- ▶ Up to 9 credits of electives

### ENVR5310 - Atmospheric Dynamics 3 credits **Master of Science (MSc) / Postgraduate Diploma (PGD) in Environmental Science and Management** (Subject to approval)

#### Foundation courses

##### Environmental Management Courses

▶ ENVR5250 - Environmental Economics and Management	3 credits
▶ ENVR5260 - Environmental Policy and Management	3 credits
▶ EVSM5230 - Environmental Health and Management	3 credits
▶ EVSM6070 - Environmental Impact Assessment (CEF course)	4 credits

##### Environmental Science Courses

▶ ENVR5340 - Fundamentals of Sustainability Science and Technology	3 credits
▶ EVSM5220 - Advanced Environmental Chemistry	3 credits
▶ EVSM5240 - GIS for Environmental Professionals	3 credits
▶ EVSM5280 - Introduction to Atmospheric Aerosols	3 credits

#### Elective Courses

##### Environmental Management Courses

▶ ENVR6090 - Special Topics in Environmental Management	1 - 4 credit(s)
▶ EVSM5270 - Environmental Law	3 credits
▶ EVSM5300 - Corporate Environmental Strategy	3 credits
▶ JEVE5900 - Carbon Management for Sustainable Environment	3 credits
▶ PPOL5190 - Policy Analysis and Design for Sustainable Development	3 credits
▶ PPOL5210 - Environmental Policy and Natural Resource Management	3 credits
▶ SOSOC5620 - Sustainable Development/ENVR6060 - Sustainability Economics	3 credits

##### Environmental Science Courses

▶ ENVR5310 - Atmospheric Dynamics	3 credits
▶ ENVR5320 - Environmental Data Analysis	3 credits
▶ ENVR6040 - Special Topics in Environmental Science	1 - 4 credit(s)
▶ ENVS5113 - Marine Ecotoxicology	3 credits
▶ ENVS5114 - Environmental Diseases and Microbiology	3 credits
▶ OCES5001 - Introduction to Oceanography	3 credits

##### Others

▶ ENVR6100 - Independent study	1 - 3 credit(s)
▶ EVSM6950 - MSc Project	3 or 6 credits
▶ JEVE5260 - Air Pollution Meteorology	3 credits
▶ JEVE5320 - Water Quality and Assessment	3 credits
▶ JEVE5420 - Biological Waste Treatment and Management	3 credits
▶ JEVE5460 - Design and Management of Physico/Chemical Processes of Environmental Engineering	3 credits

Notes:

#### MSc (EVSM)

Students are required to take a minimum of three Environmental Science courses and three Environmental Management courses. At least two Environmental Science courses and two Environmental Management courses must be chosen from the Foundation Course List. The remaining one Environmental Science course and one Environmental Management course can be from either the Foundation Course List or Elective Course List.

#### PGD (EVSM)

Students are required to take a minimum of two Environmental Science courses and two Environmental Management courses. At least one Environmental Science course and one Environmental Management course must be chosen from the Foundation Course List. The remaining one Environmental Science course and one Environmental Management course can be from either the Foundation Course List or Elective Course List.

# Course Descriptions

## Foundation Courses

### Environmental Management Courses

**ENVR 5250**  
**Environmental Economics and Management** 3 credits  
The course is designed to introduce students to key contemporary concepts in environmental economics and equip them with the approaches in economics that are generally applied to analyze environmental problems and policies.

**ENVR 5260**  
**Environmental Policy and Management** 3 credits  
This course focuses both on how to make and how to study environmental policy and management. It will review major theories related to the formulation of environmental policies, including government regulation and economic incentives, and discuss the types of policy measures implemented in various public and business sectors. The discussion of environmental problems and policies will focus on examples that are relevant for Hong Kong and the Chinese Mainland, but will also include the experience of other countries and the debate surrounding global environmental issues.

**EVSM 5230**  
**Environmental Health and Management** 3 credits  
The course will give an overview on environmental health and management, including topics on outdoor and indoor environments, workplace environment, water and sewage, food, solid waste, hazardous waste, vectors and control, radiation, environmental health standards, natural and manmade disasters, risk assessment and management, etc. Each topic will include nature of the issue, known and potential health effects, control and regulatory approaches. More in-depth discussions will be given to occupational health hazards, with emphases on current control methods and technology.

**EVSM 6070**  
**Environmental Impact Assessment** 4 credits  
Introduction to environmental impact assessment (EIA) and the EIA process in Hong Kong. The components of an EIA report including air, noise, water, waste management, environment risk, ecological impact, and socio-economic impact assessments will be analyzed. Environmental law, environmental management and the importance of public participation will also be discussed. Case studies from Hong Kong will be used and comparison with EIA in Mainland China will be made.

### Environmental Science Courses

**ENVR 5340**  
**Fundamentals of Sustainability Science and Technology** 3 credits  
The course is intended to link the interaction between the human and natural environment, focusing on how the anthropogenic activities have altered the natural environment and provide an overview on the emerging science and technology of sustainability. This course will identify the impacts associated with resource consumption and environmental pollution, and present the quantitative tools necessary for assessing environmental impacts and design for sustainability. At the end of the course, the students should be cognizant of the concept of sustainability, the metrics of sustainability and be able to use the principles of sustainable engineering in their respective field of practice.

**EVSM 5220**  
**Advanced Environmental Chemistry** 3 credits  
The course provides an in-depth coverage of topics on inorganic and organic environmental contaminants, their structures, functions, sources and emissions, distribution, transformation and fate in the environment.

**EVSM 5240**  
**GIS for Environmental Professionals** 3 credits  
Introducing GIS concept, working with spatial data, managing GIS data, integrating GIS data with Google Earth/Map, remote sensing and model data, applying GIS technology to support environmental planning and management.

**EVSM 5280**  
**Introduction to Atmospheric Aerosols** 3 credits  
Atmospheric aerosols, also known as, airborne particulate matter, are important air pollutants affecting our health, visibility, and global climate change. This course aims to provide a survey of the physical and chemical properties, the source identification, the atmospheric transformation, the sampling of atmospheric aerosols, and the determination of their chemical compositions.



Tai O Eco and Cultural Trip, Nov 2017



Congregation, Nov 2017

## Course Descriptions

### Elective Courses

#### Environmental Management Courses

##### ENVR 6060 Sustainability Economics 3 credits

This course is designed to give students an interdisciplinary understanding on the concepts of sustainability, and its contemporary trend of development. The course will cover component concepts on sustainability, its implications from resource (renewable and non-renewable) exploitation; the strength of sustainability with respect to human made or natural capitals; the assessment for sustainability; and the inter-relationships between sustainability and business, governmental policy and human communities.

##### ENVR 6090 Special Topics in Environmental Management 1 - 4 credit(s)

Offerings are announced each term, if deemed necessary, to cover emerging topics in environmental management not covered in the present curriculum.

##### EVSM 5270 Environmental Law 3 credits

The course will provide students with the basic legal concepts which include the hierarchy of courts in Hong Kong, the difference between civil and criminal proceedings and their possible redresses or remedies available from the courts. Some important provisions of the basic environmental legislation in Hong Kong, environmental prosecution policy of Hong Kong and how to instigate a judicial review against a ministerial decision relating to the environment will also be covered in the course.

##### EVSM 5300 Corporate Environmental Strategy 3 credits

The global environment will continue to degrade until there are significant changes in business practices and consumer behavior. This course will explore how environmental forces are creating threats and opportunities for business. It looks at "best practices" of numerous companies in different industries in order to understand how firms can reduce environmental harm and also be profitable. It explores how current business practices evolved to be environmentally harmful and why they are so "sticky" and resistant to change. The course uses readings, lectures and case studies for its delivery.

##### JEVE 5900 Carbon Management for Sustainable Environment 3 credits

This course focuses on quantification and management of GHG emissions. It includes organizational GHG inventories; measurement standards and protocols; carbon information management systems; low carbon solutions; carbon trading and offsetting.

##### PPOL 5190 Policy Analysis and Design for Sustainable Development 3 credits

Sustainable development problems pose some of the greatest challenges for policy makers around the world, and effective policy design requires analysts with strong subject matter understanding, creativity, and the ability to incorporate diverse perspectives and approaches. The goal of this course is to advance students' abilities to apply tools and methods, including analytical techniques and presentation skills, which are required for effective policy analysis and decision making in this area. Coursework in the course will be largely case based, and topical issues will be presented and mastered alongside different analytical skills and techniques.

##### PPOL 5210 Environmental Policy and Natural Resource Management 3 credits

This course is intended for students interested in environmental policies and management of the natural environment and its resources. The course provides students with a basic toolkit of quantitative and qualitative techniques used in resource planning and analysis, together with case studies with which to gain experience of their application. Students will also gain knowledge of regional and global directives affecting the environment, as well as approaches to policy evaluation.

##### SOSC 5620 Sustainable Development 3 credits

This course is designed to give students an understanding of how government and business professionals formulate policies related to the foundations of sustainable development. The course begins with an exploration into the concept of prosperity and conventional view of development in the context of environmental limitations. From that basis we will consider the economic, political and social ramifications of sustainable development and investigate the need for rejuvenation and innovation.

#### Environmental Science Courses

##### ENVR 5310 Atmospheric Dynamics 3 credits

The study of atmospheric motions is essential for a better understanding of the relevant meteorological phenomena. This course introduces the conservation laws for primitive equations and classical concepts in fluid dynamics, which will allow students to gain physical insight into the fundamental nature of atmospheric motions. This course is suitable for students who require the foundation of fluid dynamics for advanced study in meteorology, oceanography, atmospheric and climate sciences.

**ENVR 5320**  
**Environmental Data Analysis** 3 credits

This course is designed for students at the start of their postgraduate studies. The course will provide students with knowledge in understanding and using statistical methods in environmental science and applications. Probability distributions, parametric tests of significance against non-parametric tests, Monte Carlo methods, Principal Component Analysis, etc. will be taught in the course facilitated by extensive use of real world problems as example.

**ENVR 6040**  
**Special Topics in Environmental Science** 1 - 4 credit(s)

Offerings are announced each term, if deemed necessary, to cover emerging topics in environmental science not covered in the present curriculum.

**ENVS 5113**  
**Marine Ecotoxicology** 3 credits

This course introduces the impacts and toxic effects of environmental pollutants on growth, morphology and species richness of marine organisms with emphasis at the population, community and ecosystem level. Concepts and methods to assess the impacts of toxicants in marine organisms and environment will also be discussed.

**ENVS 5114**  
**Environmental Diseases and Microbiology** 3 credits

This course aims to study microorganisms in the natural environment and their potential impacts on human beings. Pesticides, chemicals, radiation, air and water pollution are the manmade hazards that are believed to contribute to human illness. Microorganisms or environmental agents cause airborne and waterborne infectious diseases as well as microbial biodegradation of pollutants will also be discussed.

**OCES5001**  
**Introduction to Oceanography** 3 credits

An introduction to the fundamentals of physical, chemical, geological, geochemical, and biological oceanography. It unveils the mystery of the oceans including the formation of the continents, oceanic circulation, and formation of precious minerals in the deep oceans; discovers ocean resources from phytoplankton to fish. The course will lay the foundation for sustainable use of the oceans and discuss human threats such as global warming, overfishing, and coastal pollution.

## Others

**ENVR 6100**  
**Independent Study** 1 - 3 credit(s)

Study on selected topics in environmental science under the supervision of a faculty member. The course may be repeated twice for credits if the topic is different. Graded P or F.

**EVSM 6950**  
**MSc Project** 3 or 6 credits

An independent project on selected topics in environmental science under the supervision of a faculty member. Participation of external organizations in these projects will be particularly encouraged. The responsibility of control, administration and assessment of the projects rests with University. The course may be repeated once for credits. This course is for MSc students only. Approval from instructor is required.

**JEVE 5260**  
**Air Pollution Meteorology** 3 credits

Atmospheric boundary layer, lapse rate, stability classification, atmospheric turbulence, dispersion modelling, boundary layer wind-tunnel.

**JEVE 5320**  
**Water Quality and Assessment** 3 credits

Water quality standards, chemical, physical and biological contaminants in water. General laboratory measurements and instrumental analysis based on optical, electrical and chromatography methods. Toxicity and BOD tests. Pathogenic micro-organisms and microbial examination of water. Environmental sampling and quality control and assurance.

**JEVE 5420**  
**Biological Waste Treatment and Management** 3 credits

Principles of secondary, biological treatment processes, including sewage sand filters, trickling filters, activated sludge plants, lagoons, ponds, rotating biological contactors, aerobic and anaerobic digesters, and biological nutrient removal. Management of waste treatment systems and works.

**JEVE 5460**  
**Design and Management of Physico/Chemical Processes of Environmental Engineering** 3 credits

Principles, design and management practices of physico/chemical treatment processes for removing contaminants from drinking water and municipal wastewaters; includes coagulation and flocculation, sedimentation, air flotation, centrifugation, filtration, membrane, air stripping, carbon adsorption, disinfection, chemical oxidation processes, operation management and residual management.

## Out-of-curriculum courses

A maximum of two postgraduate courses outside the above list of courses may be taken as elective(s) subject to the approval by the Program Director.

## Scholarship

A merit-based scholarship of HK\$20,000 will be offered to top students of the graduation class each academic year.

## Financial Assistance

### Continuing Education Fund

#### Reimbursable Course

Students who are Hong Kong residents and have successfully completed the foundation course – Environmental Impact Assessment (CEF course code: 21Z04168-1) in the MSc/PGD EVSM Program can apply for a subsidy from the Continuing Education Fund. Eligible applicants will be reimbursed HK\$16,000. For details, please contact the Office of the Continuing Education Fund.

Tel no.: (852) 3142-2277

<https://www.wfsfaa.gov.hk/cef/index.htm>

### Extended Non-Means-Tested Loan Scheme

Students of the MSc/PGD in EVSM program are eligible to apply for the Extended Non-Means-Tested Loan Scheme, which provides financial assistance to students in the form of loan. For details, please contact the Student Financial Assistance Agency.

Tel no.: (852) 2150-6223

<https://www.wfsfaa.gov.hk/sfo/en/postsecondary/enls/overview.htm>

## Application Procedures

All applications should be submitted through <https://pg.ust.hk/admissions> to Postgraduate Outreach and Admissions Team (PGOA) of HKUST before 1 June 2019 (Non-Local Applicants) / 15 July 2019 (Local Applicants). Late applications may be considered on a first-come-first-serve basis until all spaces are filled.

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Application Timetable for 2019/2020

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Application starts on: 3 September 2018

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Application closes on:

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Non-Local Applicants

1 June 2019

Local Applicants

15 July 2019

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Early submission is highly encouraged as qualified applicants may be admitted before the application deadline.



*Alumni Sharing, Apr 2018*

## Postgraduate Outreach and Admissions Team (PGOA)

The Hong Kong University of Science and Technology  
Clear Water Bay, Kowloon, Hong Kong  
<https://pg.ust.hk/enquiry>

## For Further Information

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