MASTER OF SCIENCE / POSTGRADUATE DIPLOMA

in Environmental Science and Management (EVSM)

2021-2022
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.

**NORMATIVE 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.

NORMATIVE 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).

CLASS SCHEDULE
Majority of the lectures will be given on the weekday evenings, with some during daytime on the weekdays and Saturday on the Clear Water Bay campus of 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
Subject to the approval of the Program Director and the University regulations governing 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 PGD 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)

<table>
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<tr>
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Postgraduate Diploma (PGD) in EVSM Program  |  HK$60,000 (15 credits only)

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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**

<table>
<thead>
<tr>
<th>Master of Science (MSc) in Environmental Science and Management Program [30 credits]</th>
<th>Postgraduate Diploma (PGD) in Environmental Science and Management Program [15 credits]</th>
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</thead>
<tbody>
<tr>
<td>• A minimum of 12 credits of foundation courses</td>
<td>• A minimum of 6 credits of foundation courses</td>
</tr>
<tr>
<td>• Up to 18 credits of electives, or electives plus MSc projects</td>
<td>• Up to 9 credits of electives</td>
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**Master of Science (MSC) / Postgraduate Diploma (PGD) in Environmental Science and Management**

**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**
- ENVR5370 - Energy Systems, Sustainability, and Policy 3 credits
- ENVR5380 - The Circular Economy – Institutions, Stakeholders and Modes of Implementation 3 credits
- 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
- SOSC5620 - Sustainable Development / ENVR6060 - Sustainability Economics 3 credits

**Environmental Science Courses**
- ENVR5310 - Atmospheric Dynamics 3 credits
- ENVR5320 - Environmental Data Analysis 3 credits
- ENVR5350 - Climate Dynamics 3 credits
- ENVR5390 - Satellite Remote Sensing and Informatics 3 credits
- ENVR6040 - Special Topics in Environmental Science 1 - 4 credit(s)
- ENVR6050 - Introduction to Oceanography 3 credits
- EVNS5113 - Marine Ecotoxicology 3 credits
- EVNS5114 - Environmental Diseases and Microbiology 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 | 3 credits**

**Environmental Economics and Management**

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 | 3 credits**

**Environmental Policy and Management**

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 | 3 credits**

**Environmental Health and Management**

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 | 4 credits**

**Environmental Impact Assessment**

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.

**ENVR 5340 | 3 credits**

**Fundamentals of Sustainability Science and Technology**

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 | 3 credits**

**Advanced Environmental Chemistry**

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 | 3 credits**

**GIS for Environmental Professionals**

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 | 3 credits**

**Introduction to Atmospheric Aerosols**

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.
EVSM 5270 | 3 credits
Environmental Law
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 | 3 credits
Corporate Environmental Strategy
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 | 3 credits
Carbon Management for Sustainable Environment
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.

ENVR5370 | 3 credits
Energy Systems, Sustainability, and Policy
This course provides postgraduate students the opportunity to enhance their multidisciplinary understanding of sustainable energy systems, transitions, and policy, with regards to the need to deliver sustainable development for all and accelerating climate action. With climate change accelerating, the ways we generate, distribute and use energy has been duly challenged, opening up new opportunities to rethink a rapid shift from fossil fuel-based generation to the deployment of sustainable energy systems. This course offers students a wide range of topics from conventional to renewable energy generation to electric mobility and transport to transmission and storage to markets and multi-level policy approaches to effect sustainable energy transitions. The course exposes the students to the sociotechnical nature of energy systems—in Hong Kong, China, and internationally, and an understanding that energy systems are not purely technological systems but are also embedded within politics and social dynamics.

ENVR5380 | 3 credits
The Circular Economy - Institutions, Stakeholders and Modes of Implementation
This course provides an insight into the circular economy (CE) concept and its modes of implementation. While the central focus is laid on the CE development in China, comparisons with particular CE elements from other countries such as Germany, Japan and the European Union will be conducted. The main thematic content of this course are (1) institutional structures, (2) eco-industrial park estates and (3) waste management.

ENVR 6060 | 3 credits
Sustainability Economics
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 | 1 - 4 credit[s]
Special Topics in Environmental Management
Offerings are announced each term, if deemed necessary, to cover emerging topics in environmental management not covered in the present curriculum.
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 | 3 credits**

**Sustainable Development**

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 | 3 credits**

**Atmospheric Dynamics**

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 | 3 credits**

**Environmental Data Analysis**

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 5350 | 3 credits**

**Climate Dynamics**

This course covers the dynamics of the atmosphere and ocean and the coupled dynamics, which govern our weather and climate. The course will introduce the essential features of the atmosphere and ocean circulation, as well as theories about instabilities in geophysical fluids. Knowledge and skills for running weather and climate models and analyzing data are also practiced in the course.

**ENVR5390 | 3 credits**

**Satellite Remote Sensing and Informatics**

Satellite remote sensing technique measures geophysical parameters from the electromagnetic energy emitted or reflected from the earth, and can be used to estimate earth surface characteristics, atmospheric compositions and profiles, and meteorological processes. This course provides a brief overview of the fundamental essentials to understand the remote sensing process, satellite data products, and their applications in atmosphere, land, and ocean.

**ENVR 6040 | 1 - 4 credit(s)**

**Special Topics in Environmental Science**

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

**ENVR 6050 | 3 credits**

**Introduction to Oceanography**

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.

**ENVS 5113 | 3 credits**

**Marine Ecotoxicology**

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 | 3 credits**

**Environmental Diseases and Microbiology**

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.
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.

Others

ENVR 6100 | 1 - 3 credit(s)
Independent Study
Study on selected topics in environmental science under the supervision of a faculty member. The course may be repeated once for credits if the topic is different. Graded P or F.

EVSM 6950 | 3 or 6 credits
MSc Project
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 | 3 credits
Air Pollution Meteorology
Atmospheric boundary layer, lapse rate, stability classification, atmospheric turbulence, dispersion modelling, boundary layer wind-tunnel.

JEVE 5320 | 3 credits
Water Quality and Assessment
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 | 3 credits
Biological Waste Treatment and Management
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 | 3 credits
Design and Management of Physico/Chemical Processes of Environmental Engineering
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.
SCHOLARSHIPS

UGC TARGETED TAUGHT POSTGRADUATE PROGRAMMES FELLOWSHIPS SCHEME (PRIMARY PRIORITY AREA: SUSTAINABLE CITY) (FOR LOCAL APPLICANTS ONLY)

MSc in Environmental Science and Management has been approved as one of the targeted programs of the Fellowships Scheme. Local students who are admitted to the program for both full-time and part-time modes will be invited to submit applications for the fellowships. To avoid double subsidy, students who are receiving other forms of government scholarship (except student financial assistance) for pursuing the same program will not be considered, and the fellowship students are not eligible for CEF reimbursement. The fellowship students are required to pay a minimum tuition fee of HK$42,100, which is the prevailing rate of the UGC-funded programs, and the differences will be subsidized by the fellowships subject to a cap of HK$120,000 for each student regardless of the actual study period of the program.

ACADEMIC SCHOLARSHIP FOR MSC IN ENVIRONMENTAL SCIENCE AND MANAGEMENT PROGRAM

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 reimbursement of course fee (HK$16,000) and may be reimbursed up to 80% for the first HK$10,000 and 60% for the second HK$10,000 of the course fee respectively. For claiming CEF, claimant should pass BOTH the attendance requirements and course assessments of the course, with the attendance rate and overall mark of course assessments not less than 80% and 50% respectively. For details, please contact the Office of the Continuing Education Fund.


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.


APPLICATION PROCEDURES

All applications should be submitted through https://pg.ust.hk/prospective-students/admissions/online-application to Postgraduate Outreach and Admissions Team (POGA) of HKUST before 1 June 2021 (Non-Local Applicants) / 30 June 2021 (Local Applicants). Late applications may be considered on a first-come-first-serve basis until all spaces are filled.

APPLICATION TIMETABLE FOR 2021/2022

Application starts on | 1 September 2020
Application closes on | Non-Local Applicants: 1 June 2021
Local Applicants: 30 June 2021
FOK YING TUNG GRADUATE SCHOOL
The Hong Kong University of Science and Technology
Clear Water Bay, Kowloon, Hong Kong
https://pg.ust.hk/enquiry

FOR FURTHER INFORMATION
Ms. Sharon Chong | Manager (Administration)
Division of Environment and Sustainability
The Hong Kong University of Science and Technology
(852) 2358-8363 | (852) 2335-9317

http://www.envr.ust.hk