

PROGRAM STRUCTURE AND CURRICULUM

Master of Science (MSc) in Environmental Science and Management Program (30 credits)	Postgraduate Diploma (PGD) in Environmental Science and Management Program (15 credits)
<ul style="list-style-type: none"> A minimum of 12 credits of foundation courses Up to 18 credits of electives, or electives plus MSc projects 	<ul style="list-style-type: none"> A minimum of 6 credits of foundation courses Up to 9 credits of electives

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
• SOSOC5620 - Sustainable Development	3 credits
Environmental Science Courses	
• ENVR5290 - Climate Change: Science, Policy and Management	3 credits
• 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
• ENVS5113 - Marine Ecotoxicology	3 credits
• ENVS5114 - 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 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 and Chinese Mainland. 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 and Chinese Mainland will be used and comparison with EIA in Mainland China will be made.

Environmental Science Courses

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

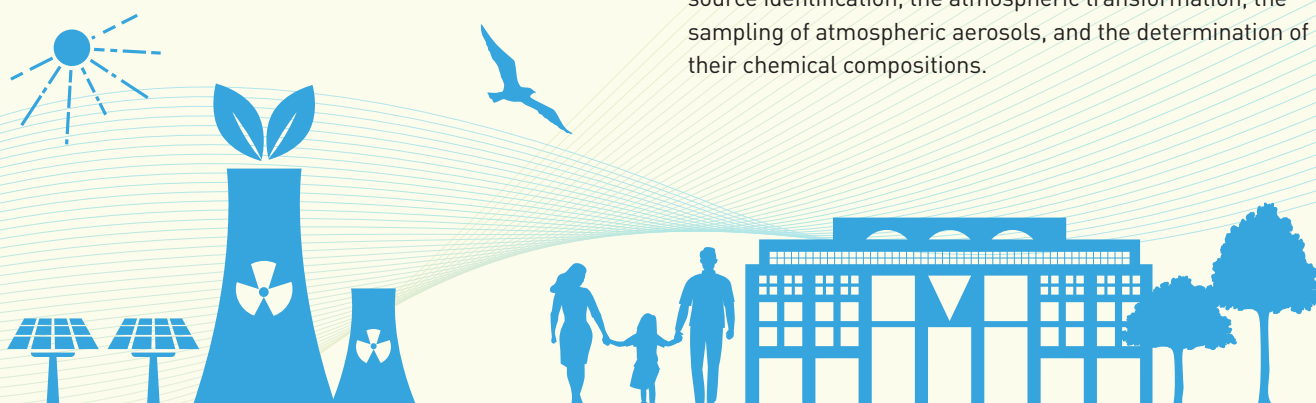
GIS for Environmental Professionals

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.



ELECTIVE COURSES

Environmental Management Courses

ENVR 5370 | 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 and Chinese Mainland, and internationally, and an understanding that energy systems are not purely technological systems but are also embedded within politics and social dynamics.

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 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.

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 and Chinese Mainland, 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 and Chinese Mainland, environmental prosecution policy of Hong Kong and Chinese Mainland 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.

PPOL 5190 | 3 credits

Policy Analysis and Design for Sustainable Development

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 | 3 credits

Environmental Policy and Natural Resource Management

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 | 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 5290 | 3 credits

Climate Change: Science, Policy and Management

This course prepares graduate students for the development of interdisciplinary research on environmental science, policy and management through a detailed investigation of climate change issues. Based on a review of the scientific research and models that have been developed through international cooperation, students will discuss relevant approaches of atmospheric and oceanographic science and the likely consequences in terms of climate change. In addition, the various technologies of mitigation and adaptation will be surveyed, leading to a discussion of appropriate policies for managing climate change at the global or national level.

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.

ENVR 5390 | 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.

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.

Degree Awarding and Postgraduate Diploma Awarding

After completing all the courses, publishing academic papers in international journals and passing the defense, you will be awarded a dual master's degree (MEnvSc) from STU and APSB; After completing all the courses, failing to publish academic papers in international journals but submitting in-school thesis and passing the defense, a dual master's degree (MEnvSc) from HKAOM and APSB can be awarded; Those who have completed all the courses, but have not published any academic papers or submitted their papers to the university, will be awarded the Postgraduate Diploma in Environmental Science jointly issued by the three universities.

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.