ENVIRONMENTAL & WATER TECHNOLOGY COURSE MODULES (YEAR 1)

A growing world population and climate change are set to bring about the need to increase water supplies. Be at the frontline to combat environmental challenges when you join the Diploma in Environmental & Water Technology [EWT]. Jointly developed with PUB, Singapore's National Water Agency, this diploma will equip you with a firm grounding in the key areas of water technology, waste management and resource conservation, as well as pollution monitoring and control.

In your first year, you will be introduced to basic concepts of environmental science, engineering and technology with modules such as Noise Monitoring & Control, Computer Aided Design and Hydraulics. From the second year onwards, you will learn in- depth modules in various aspects of environmental engineering and water technology, such as air and water quality monitoring & control.

In your final year, you will work on an environmental innovation & research project and go on a four- month internship. You can opt for hands-on learning opportunities at our Centre of Innovation in Environmental and Water Technology [COI-EWT] and work alongside research engineers and scientists on industry-based projects. All EWT students have the chance to learn about sustainable environmental practices by participating in an enhanced study trip to destinations such as South Korea or Taiwan.

With additional Workforce Skills Qualification [WSQ] Certificates in Noise Monitoring, Industrial Noise Control and Risk Management, you can look forward to better job prospects in the industry.

LEVEL 1.1

Career & Professional Preparation I

This module is part of the Education and Career Guidance framework to provide students with the tools and resources necessary for their career and/ or further education. In this first module, students will undergo personal discovery and exploration of industry and career prospects. Students will learn how to plan and set achievable goals in preparation for their future. Students will also learn the importance of passion and professionalism, and basic teamwork and interpersonal skills.

Computer Aided Design

This module provides students with the principles and techniques of preparing computer-aided design (CAD) drawings in environmental related applications and construction projects. Students will be exposed to applications of AUTOCAD in environmental project work including noise mapping, sewerage and drainage diagrams, process plant diagrams and site plans. Students will also be trained to interpret and extract information from CAD drawings and prepare CAD drawings according to CP 83. Emphasis will be placed on preparing CAD drawings accurately so that information can be used electronically. AutoCAD is used in this module as it is widely adopted in the AEC industry.

Engineering Mathematics 1

In this module, students will study mathematical subjects relevant to engineering applications. This module provides them with the necessary mathematical skills required in other engineering subjects. Topics include algebra, exponential and logarithmic functions, trigonometry, combination and permutation, plane analytical geometry, binomial expansion, determinants and matrices.

Environmental Microbiology & Biotechnology

Sustainable development calls for newer approaches towards developmental activities and technologies, so that eco- health is preserved alongside conservation of invaluable natural resources. Environmental biotechnology is a tool that provides such an approach for understanding, managing, preserving and restoring environmental quality. Students will be exposed to the fundamentals of microbiology and biotechnological methodologies that can be suitably utilised to assess the well-being of ecosystems, transform pollutants to harmless substances, generate biodegradable materials from renewable sources, and develop eco-friendly manufacturing and disposal processes. Applications, including recent developments in the field of microbiology and biotechnology in aspects relating to

the environment will be covered.

Noise Monitoring & Control

Singapore's rapid economic growth towards an industrialised and urbanised society coupled with an affluent population has resulted in a greater need to control noise in the general environment. The control of noise pollution is essential in all aspects of work and students will be taught the fundamentals of how noise pollution arises, health impacts of noise, measurement and monitoring of noise levels, preventive and control measures and local environmental legislation. The module provides for two WSQ recognised certifications under Competency unit of Monitor Noise and Vibration (Competency Code: OH-PH-501C-1) and Competency unit of Control Noise and Vibration (Competency Code: OH-PH-502C-1), if students qualify based on the WSQ assessment plan.

Organic & Biological Chemistry

This practical-oriented module is designed to give students an introduction to organic and biological chemistry. Students will be introduced to the chemistry of hydrocarbons, alcohols, amines, carboxylic acids and their derivatives. The structure, function and chemical reactions of carbohydrates, lipids, proteins, nucleic acids, enzymes and coenzymes are also covered.

LEVEL 1.2

Engineering Mathematics 2

A continuation of the Engineering Mathematics 1 module, topics in this module include complex numbers, statistical techniques, differentiation, integration, further integration techniques and numerical methods for evaluating definite integrals. Emphasis is placed on their applications in solving engineering- related problems. A mathematical software package is also used to solve these problems.

Environmental Health & Biology

This module introduces students to the field of environmental health science and provides a foundation for further studies and application in environmental law, safety and health management. Students will be trained in the areas of microbiology, parasitology, entomology, vector control, epidemiology and communicable disease control, human biology and food hygiene.

Global Environmental Issues

With globalisation, the growth of the human population and technological advances, pressures on the planet's natural systems are becoming increasingly intense and complex. This module discusses current global environmental issues and the interaction between human activities, resources, and the environment. Contributing social, political and economic factors will be covered. Mitigation measures such as research, conservation, role of media, volunteer work and technology will be emphasised. The aim of this module is to promote greater environmental awareness and nurture social responsibility towards the environment.

Hydraulics

Students will learn the basic hydraulic principles and concepts which are essential for the study of water and wastewater treatment technologies. Students will be exposed to properties of fluids, manometers, hydrostatics and fundamental principles of fluid flow. Head losses in pipeline, design of pipeline, flow measurements and pipe network analysis will be covered. Students will also learn the open channel flow, the design of surface water drainage systems and pumping pipeline systems.

Inorganic & Physical Chemistry

This module covers the principles of physical chemistry as well as the reactions and properties of inorganic compounds. Students will study the structure of matter, chemical bonding, chemical calculations, electrochemistry and redox reactions, chemical equilibria, ionic equilibria, chemical kinetics, thermochemistry, transition metal chemistry and chemistry of solutions, including acids and bases.

COURSE CURRICULUM (YEAR 1)

Module Name	Credit Units
YEAR 1	
Level 1.1 (26.5 hours per week)	
Career & Professional Preparation I	1
Computer Aided Design	3
Engineering Mathematics 1	6
Environmental Microbiology & Biotechnology	3.5
Noise Monitoring & Control	4
Organic & Biological Chemistry	6
Innovation Made Possible ^	3
Level 1.2 (27.5 hours per week)	
Engineering Mathematics 2	6
Environmental Health & Biology	3.5
Global Environmental Issues	2
Hydraulics	5
Inorganic & Physical Chemistry	6
Communication Essentials ^	3
Sports & Wellness ^	2

Notes:
^ For more details on Interdisciplinary Studies (IS) electives, please log on to www.np.edu.sg/is/

IS Modules
The School of Interdisciplinary Studies (IS) delivers a broad-based curriculum, which nurtures a new generation of professionals with multidisciplinary skills and an innovative and entrepreneurial spirit to meet the challenges of a knowledge economy. IS offers both prescribed modules and electives to challenge boundaries. Prescribed modules develop students' competencies in core areas such as Communication, Innovation and Enterprise, Culture and Communication, and Personal Mastery and Development, while elective modules provide insights into Arts and Humanities, Business, Design, and Science and Technology.