ENVIRONMENTAL & WATER TECHNOLOGY COURSE MODULES (YEAR 2)

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 2.1

Career & Professional Preparation II

This module is part of the Education and Career Guidance framework to provide students with the tools and resources necessary for their further career and/ or education. In this module, students will explore basic job search strategies, practice writing of effective resumes and cover letters, and learn interview skills. Students will also learn professional and intercultural communication skills to prepare them for a dynamic and diverse workplace.

Engineering Mathematics 3

Building upon the materials covered in Engineering Mathematics 1 and 2, this module provides students with an adequate knowledge of mathematics to solve problems encountered in their future work. Topics include vector algebra, first and second order differential equations and their applications, Laplace Transform technique and its applications, and Regression Analysis. Students will also use a mathematical software package to solve these problems.

Solid & Hazardous Waste Management

In this module, students will be taught how solid and hazardous waste is generated, methods of collection, handling, treatment, disposal of waste and related pollution impacts. Concepts of waste minimisation such as recycling, reuse, reduction and waste exchange will be highlighted as effective tools for sustainable waste management. Issues in hazardous waste with emphasis on biomedical waste generation, collection and treatment will be addressed. Local legislation for solid and hazardous waste will be explained in relation to the overall waste management system.

Water & Environmental Chemistry

This practice-oriented module introduces students to key aspects of environmental and water chemistry for application in pollution control, resource recovery and water and wastewater treatment. Students will have hands-on exposure to practical aspects of environmental chemistry, quantitative measurements and analysis of solid wastes, water and wastewater. Principles of measurement, instrumentation and analysis are emphasised using an application-oriented approach.

Water & Marine Pollution

Students will be given an overview of water pollution and the impact of pollution on different types of waterbodies like rivers, lakes and seas. They will learn the characteristics of polluted waterbodies, types of waste streams and indicators of water pollution, waste disposal into river and the self-purification of river systems. Effects of pollution in lakes and reservoirs, marine pollution, sources and impacts of pollution in sea and oil spill control at sea and beaches will also be covered.

Water Supply Technology & Design

This module introduces the concepts of water treatment technologies for treating raw water from various sources. The focus in this module is to impart knowledge on the conventional water treatment technologies. The topics covered include pre-treatment, sedimentation, filtration and disinfection techniques for the treatment of potable water. Adverse effects of hardness and hardness treatment using chemical methods and the use of ion-exchange processes are covered in detail. Practical problems associated with the operation and maintenance of water treatment plants including mechanical & electrical equipment and possible solutions for these problems will be emphasised.

LEVEL 2.2

ABC Waters Management

Singapore has an extensive network of waterways and waterbodies allowing efficient stormwater management. This module provides an introduction to the Active, Beautiful and Clean (ABC) Waters Programme as part of the initiative to remake Singapore into a vibrant 'City of Gardens and Water'. Students will be taught about the role of ABC Waters design features in keeping Singapore's waterways and waterbodies clean by retaining and treating stormwater close to the source. Other topics covered include design concepts of sedimentation basins, vegetated swales and bioretention systems.

Air Quality Monitoring & Control

Monitoring and control of both outdoor and indoor air pollution are important aspects of environmental management. Students are taught the fundamentals of how air pollution arises, types of pollutants, and their environmental and health impacts. Dispersion modelling, indoor air quality audit, sampling and monitoring of pollutants, techniques of identification of pollutants, preventive and control measures, local environmental legislation and guidelines on air quality including PSI will be introduced.

Civil Engineering Fundamentals

This module explores the fundamental principles and practices of civil engineering. It provides students with an understanding of the main types of civil engineering structures and construction processes. It also covers the theory of statics and mechanics of materials, with applications to a range of environmental engineering projects.

Environmental Process Systems

In this modules, students will focus on reactor design principles. Topics include reactor kinetics, analysis of batch reactors, continuous stirred tank reactors and plug flow reactors. It also covers material balance calculations as well as aspects of the design, construction and operation of chemical and biological reactors, process control systems and diagrams. Examples from the water, wastewater and environmental industry will be used to reinforce the content.

Workplace Safety & Health

The module covers the relevant legislation and standards pertaining to workplace safety and health. Students will be taught to identify the various types of workplace hazards and the means of protection and control against these hazards. The topics will include risk assessment and control, safety management systems, job safety analysis, accident reporting and investigation. Students will be issued WSHC recognized bizSAFE Level 2 certificates upon completion of this module.

World Issues: A Singapore Perspective^

This module develops a student's ability to think critically on world issues. Students will discuss a wide range of social, political and cultural issues from the Singapore perspective. It also looks at how city-state Singapore defied the odds and witnessed close to half a century of rapid economic growth, strong political ties and social harmony.

COURSE CURRICULUM (YEAR 2)

Module Name	Credit Units
YEAR 2	
Level 2.1 (24.5 hours per week)	
Career & Professional Preparation II	2
Engineering Mathematics 3	4

Solid & Hazardous Waste Management	3
Water & Environmental Chemistry	5
Water & Marine Pollution	3
Water Supply Technology & Design	5.5
Interdisciplinary Studies (IS) elective ^	2
Level 2.2 (23 hours per week)	
ABC Waters Management	4
Air Quality Monitoring & Control	5
Civil Engineering Fundamentals	6
Environmental Process Systems	3
Workplace Safety & Health	3
World Issues: A Singapore Perspective ^	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.