Subject Description Form

Subject Code	ABCT4774
Subject Title	POLLUTION CONTROL AND ENVIRONMENTAL ANALYSIS LABORATORY
Credit Value	1
Level	4
Co-requisite	Pollution Control and Environmental Analysis
Objectives	This subject aims to apply the fundamental principles and techniques covered in the subject ABCT4757 Pollution Control and Environmental Analysis for practical measurements of water and wastewater quality parameters and removal of pollutants.
Intended Learning Outcomes	Upon the completion of this subject, students will be able to a. explain the principles of methods for the analysis of water and wastewater quality and removal of pollutants; b. deploy and apply the techniques for analysis of water and wastewater quality and removal of pollutants in laboratory; c. strength further the ability to work in a team, to plan and carry out experiments, to collect experimental data, to apply the principles and concepts learned in ABCT4757 to critically analyze and interpret the experimental results, and to write formal scientific and technical reports.
Subject Synopsis/ Indicative Syllabus	Measurement of water quality parameters including turbidity, conductivity, alkalinity, hardness and solids in water and wastewater Determination of biochemical oxygen demand Determination of chemical oxygen demand and total organic carbon Jar test for determining optimum coagulant dose for removal of colloidal solids in wastewater Determination of Kjeldahl nitrogen Application of ion chromatography for determination of inorganic anions in drinking water and mineral water

Teaching/Learning Methodology

Laboratory manuals will be provided to students and they are required to read through the lab manual and meet with the lab group to discuss and prepare the experiments before the laboratory sessions. The students will work in teams to plan and carry out experiments for analysis of water and wastewater quality, to collect experimental data, to critically analyze and interpret results, and to write formal technical reports. During the laboratory sessions, the demonstrators will provide technical guidance on involved experimental matter if required. To develop students' ability to think critically and apply concepts and knowledge learned in class to each experiment, the demonstrators will ask student critical questions about the experiments. Students are required to submit formal written reports and provide answers to specific questions listed in the laboratory manual.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c			
1. Laboratory performance & reports	70	√	√	√			
2. Test	30	√	√				
Total	100 %						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The performance of the students will be assessed during the course of the experiment. Their written reports will also be assessed. Written test will also be given to assess the students' understanding of the methods and techniques for the analysis of water and wastewater quality and removal of pollutant.

Student Study Effort Expected

Class contact:	
▪ Laboratory	20 Hrs.
Other student study effort:	
▪ Pre-laboratory preparation	5 Hrs.
▪ Self study (reading textbooks, reference books, etc)	10 Hrs.
▪ Writing lab reports	20 Hrs.
Total student study effort	55 Hrs.

Reading List and References	1. *Standard Methods for the Examination of Water and Wastewater*, 21st ed., American Public Health Assoc., American Water Works Assoc. and Water Pollution Control Fed., Washington, D.C., 2005. 2. Weiner, E. R. *Applications of Environmental Aquatic Chemistry*: *A Practical Guide*, 2nd ed. Boca Raton, FL: CRC Press, 2008. 3. Hammer, M. J. and Hammer J. R. *Water and Wastewater Technology*, 6th ed. Prentice Hall, 2008. 4. Sawyer, C. N., McCarty, P. L. and Parkin, G. F. *Chemistry for Environmental Engineering and Science*, 5th ed. McGraw Hill, 2003. 5. Eckenfelder, Jr. W. W. *Industrial Water Pollution Control*, 3rd ed. McGraw Hill, 2000. 6. Environmental Protection Department. *Environment Hong Kong* (Current Editions). Hong Kong Government Publication.