

<b>Subject Code</b>	CSE29364
<b>Subject Title</b>	Environmental Engineering
<b>Credit Value</b>	2
<b>Level</b>	2
<b>Pre-requisite / Co-requisite/ Exclusion</b>	Nil
<b>Objectives</b>	(1) To provide basic understanding of major global environmental issues to achieve the goal of sustainable development; (2) To provide basic environmental engineering knowledge on water, air and noise pollution as well as solid waste management.
<b>Intended Learning Outcomes</b>	Upon completion of the subject, students will be able to: a. apply basic environmental chemistry related to air and water quality assessment in laboratory works to solve analogous problems; b. identify and analyse diverse air and water pollution problems for local air pollution control, water management and purification works, and to recognize the need for and to engage in life-long learning. c. communicate logically through drawing, calculation and in writing.
<b>Subject Synopsis/ Indicative Syllabus</b>	<ol style="list-style-type: none"> <li>1. <u>Introduction to Water Pollution and Solid Waste Management</u> Quantity and quality of raw water, wastewater and their sources. eutrophication and water quality standard. Quantity, composition, and types of solid wastes. General solid waste management system.</li> <li>2. <u>Principle of Water Treatment</u> Purpose, layout and function of the unit operations and processes of potable water treatment system.</li> <li>3. <u>Principle of Sewage Treatment</u> Purpose, layout and function of the unit operations and processes of typical sewage treatment system including preliminary, primary, secondary and sludge treatment. Effluent discharge standard relevant to Hong Kong.</li> <li>4. <u>Introduction to Air Pollution</u> General air pollutant properties and pollution sources, air pollution impact to health and ecology, air quality measurement and assessment, and basic air pollution control.</li> <li>5. <u>Principle of Noise Pollution</u> Properties of sound waves, power and intensity, levels and the decibel, noise impact and measurement, basic noise control.</li> <li>6. <u>Global Environmental Issues</u> Climate change and greenhouse effect, ozone layer depletion, sustainable development.</li> </ol>

<b>Teaching/Learning Methodology</b>	Fundamental knowledge will be covered in lectures. Tutorials will provide opportunities for discussion of lecture materials and will also be conducted in the forms of slide and video presentation or field visits and problem-solving session to supplement understanding from lectures. Laboratory work will help students appreciate the basic principles and familiarize themselves with basic instruments.																																				
<b>Assessment Methods in Alignment with Intended Learning Outcomes</b>	<table border="1" data-bbox="496 472 1396 813"> <thead> <tr> <th data-bbox="496 472 815 544" rowspan="2">Specific assessment methods/tasks</th> <th data-bbox="815 472 983 544" rowspan="2">% weighting</th> <th colspan="3" data-bbox="983 472 1396 544">Intended subject learning outcomes to be assessed</th> </tr> <tr> <th data-bbox="983 544 1118 577">a</th> <th data-bbox="1118 544 1254 577">b</th> <th data-bbox="1254 544 1396 577">c</th> </tr> </thead> <tbody> <tr> <td data-bbox="496 577 815 656">1. Assignments and seminar report</td> <td data-bbox="815 577 983 656">5</td> <td data-bbox="983 577 1118 656">✓</td> <td data-bbox="1118 577 1254 656">✓</td> <td data-bbox="1254 577 1396 656">✓</td> </tr> <tr> <td data-bbox="496 656 815 689">2. Laboratory Reports</td> <td data-bbox="815 656 983 689">15</td> <td data-bbox="983 656 1118 689">✓</td> <td data-bbox="1118 656 1254 689"></td> <td data-bbox="1254 656 1396 689"></td> </tr> <tr> <td data-bbox="496 689 815 723">3. Tests</td> <td data-bbox="815 689 983 723">10</td> <td data-bbox="983 689 1118 723">✓</td> <td data-bbox="1118 689 1254 723">✓</td> <td data-bbox="1254 689 1396 723">✓</td> </tr> <tr> <td data-bbox="496 723 815 757">4. Final Examination</td> <td data-bbox="815 723 983 757">70</td> <td data-bbox="983 723 1118 757">✓</td> <td data-bbox="1118 723 1254 757">✓</td> <td data-bbox="1254 723 1396 757">✓</td> </tr> <tr> <td data-bbox="496 757 815 813">Total</td> <td data-bbox="815 757 983 813">100</td> <td data-bbox="983 757 1118 813"></td> <td data-bbox="1118 757 1254 813"></td> <td data-bbox="1254 757 1396 813"></td> </tr> </tbody> </table> <p data-bbox="496 853 1396 958"><b>Students must attain at least grade D in both coursework and final examination (whenever applicable) in order to attain a passing grade in the overall result.</b></p> <p data-bbox="496 999 1396 1070">Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <ol data-bbox="496 1111 1396 1541" style="list-style-type: none"> <li>(1) Assignments based on calculations and experimental data to assess the air, noise and water pollution problems, and water qualities. Seminar report should be related to environmental issues.</li> <li>(2) Laboratory works and report writing will enable students to familiarize with practical experiment and in-depth understanding on the assessment of water qualities, air pollutant and noise measurement techniques, as well as training for group work and sharing individual responsibility.</li> <li>(3) Test and examination can attribute critical and creative thinking for independent work and ability to evaluate and solve environmental engineering on pollution problems related to air and water, noise abatement, and solid waste management.</li> </ol>				Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed			a	b	c	1. Assignments and seminar report	5	✓	✓	✓	2. Laboratory Reports	15	✓			3. Tests	10	✓	✓	✓	4. Final Examination	70	✓	✓	✓	Total	100			
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**Reading List and  
References**

Reading

Hammer, M.J. *Water and Wastewater Technology*, Prentice-Hall, 2003.

Mackenzie L. Davis, Susan J. Masten, *Principles of Environmental Engineering and Science*, 2<sup>nd</sup> Edition, McGraw. Hill, 2009.

Clair N. Sewyar, Perry L. McCarty and Gene F. Parkin, 5th Edition, McGraw Hill, 2003.

Reference

Mackenzie L. Davis, David A. Cornwell., *Introduction to Environmental Engineering*, McGraw-Hill, 2008.

Noel DeNevers, *Air Pollution Control Engineering*, 2<sup>nd</sup> Edition, McGraw Hill, 2000.