

Subject Description Form

Subject Code	ABCT1D09
Subject Title	Green House Gases and Life
Credit Value	3
Level	1
Pre-requisite	NIL
Co-requisite	NIL
Exclusion	
Objectives	This subject aims to introduce the scientific aspects of atmospheric gases, environmental impact and ethical issues in our society.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: <ol style="list-style-type: none">1. understand the basic constituents and fate of the atmospheric gases,2. identify the sources of green house gases and their environmental impact, such as climate change and their biological interaction,3. demonstrate analytical and critical thinking for the impact of green house gases via scientific, technological and business point of view,4. realize the industrial, social and national responsibility in reducing green house gases production, advanced technology to handle green house gases,5. appreciate current issues, including impact from society, environment, economy as well as ecology related to green house gases,6. appreciate the importance of lifelong learning, teamwork, and communication skills.
Subject Synopsis/ Indicative Syllabus	<p>Basic principles and fundamentals of environmental science and technology will be introduced in this course. Common ideas of green house gases and their impact on environment will also be introduced.</p> <p>(a) Essentials of green house gases (carbon dioxide and others)</p> <ul style="list-style-type: none">- sources and industrial revolution- air pollution issues- chemical/biological reactions and environmental interaction- market of carbon/green house gases

	<p>(b) Role of government, industry and society</p> <ul style="list-style-type: none"> - technology to handle green house gases - law and regulation - education - global warming and Kyoto Protocol <p>(c) Impact to ecology</p> <ul style="list-style-type: none"> - introduction - unpredictable climate changes - What controls the carbon balance of ecosystems? - How do ecosystems influence climate? - other consequences
<p>Teaching/Learning Methodology</p>	<p>Lectures: Basic principles and fundamentals of environmental science, technology and trade market for carbon/green house gases will be introduced and discussed. Students can acquire basic chemical and biological knowledge to further develop analytical skills as well as critical and creative thinking.</p> <p>Tutorials: Students are required to look at information and they are encouraged to discuss for selected topics. Tutorial questions and cases will be used to draw students' interest and discussion. Through the tutorial questions, logical thinking will be developed.</p> <p>Laboratories: Simple experiments for green house gases analysis will be introduced. For the laboratory, students are required to collect scientific data, and they can acquire analytical skills as well as critical and creative thinking for conducting experiments and writing scientific reports. For report preparation, lifelong learning skills will be implemented, and students are required to search for information from literatures and reference books. In addition, students will develop team spirit through the laboratory activities.</p> <p>Group presentation: Students are required to deliver a presentation based on selected topics. Through group presentation, students can consolidate their higher order thinking, such as problem identification and solving skill, analytical mind, as well as critical and creative thinking for conducting experiments and report writing. Creative ideas can be solicited through the preparation of group presentation and discussion among the students. For group presentation, the students can apply their lifelong learning skill and can draw conclusion and recommendation. In this subject, students are required to do extensive reading (such as published literatures, reference books and government reports/websites and internet) and analyze information for possible action formulation via self-study and group communication. Students are also required to write an individual report on their findings for consolidation and elaboration of concept. These training elements will strengthen the literacy and communication skills of students.</p>

Assessment Methods in Alignment with Intended Learning Outcomes	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
			1	2	3	4	5	6
	1.Test	30%	✓	✓	✓	✓	✓	✓
2.Laboratory work	20%			✓			✓	
3.Group Project		✓	✓	✓	✓	✓	✓	
a. Presentation	10%							
b. Individual written report	15%							
c. Reflective journal	5%							
4.In-class tutorials	20%	✓	✓	✓	✓			
Total	100 %							
<p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>Test: To assess the students' understanding of the basic principles of science and technology related to environmental protection. The students' higher order thinking, such as analytical and problem solving skills, critical thinking and creative thinking, will be evaluated. [Outcomes 1-6]</p> <p>Laboratory work: Student performance during the laboratory classes will be assessed, and their report will be graded. The students' higher order thinking, such as the analytical mind, data collection as well as report writing skill will be assessed and evaluated. Students will develop their teamwork skill during practical classes. [Outcomes 3 and 6]</p> <p>Group presentation: Students will be assessed based on their individual performance, such as presentation skill, creativity and critical thinking. Their grades will also be evaluated based on their team spirit, the prepared content as well as their response to questions raised by subject lecturer(s) and peers. [Outcomes 1-6]</p>								
Student Study Effort Required	Class contact:							
	▪ Lecture							20 Hrs.
	▪ Tutorial							11 Hrs.

	<ul style="list-style-type: none"> ▪ Laboratory 	8 Hrs.
	Other student study effort:	
	<ul style="list-style-type: none"> • Preparation of presentation and report 	22 Hrs.
	<ul style="list-style-type: none"> • Self study (reading on literature, reference books, textbooks and reports) 	70 Hrs.
	Total student study effort	131 Hrs.
Reading List and References	<ol style="list-style-type: none"> 1. Lecture notes and support materials will be provided 2. Ecology, 2011, Michael L. Cain, William D. Bowman, Sally D. Hacker, Sunderland, Mass. : Sinauer Associates, ISBN 9780878934454 (hb) 3. Air pollution : health and environmental impacts, 2010, Bhola R. Gurjar, Luisa T. Molina, Chandra S.P. Ojha, Boca Raton, CRC Press, ISBN 9781439809624 4. Environmental and regional air pollution, 2009, Dean Gallo and Richard Mancini, Hauppauge, Nova Science, ISBN 9781606928936 5. Essentials of environmental management, 2004, Paul Hyde and Paul Reeve, Wigston : IOSH, ISBN 9780901357366 6. Green Business, 2011, Nevin Cohen, Green Society ISBN 9781412996846 7. Relevant website where information on most of the topics covered in the syllabus are available: http://www.epd.gov.hk; http://www.epa.gov/; http://www.environment.gov.au/; http://www.eea.europa.eu/; http://www.environment-agency.gov.uk/ 	