

# The Hong Kong Polytechnic University

## Subject Description Form

*Please read the notes at the end of the table carefully before completing the form.*

<b>Subject Code</b>	BSE1BN04
<b>Subject Title</b>	Creating Sustainable Living Environments
<b>Credit Value</b>	3
<b>Level</b>	1
<b>Pre-requisite/ Co-requisite/ Exclusion</b>	Exclude BSE1B01 and BSE1B04
<b>Objectives</b>	<p>(a) The subject fulfils the following GUR requirements:</p> <ul style="list-style-type: none"><li>○ Healthy living and self understanding interpersonal skills</li><li>○ Teamwork and leadership</li><li>○ Critical and creative thinking and problem solving skills</li><li>○ Social responsibility</li><li>○ Global outlook and lifelong learning</li></ul> <p>(b) The aim of the subject is to enable students to:</p> <ul style="list-style-type: none"><li>○ understand different environments;</li><li>○ be aware of the needs of sustainable development;</li><li>○ recognise built sustainable features.</li><li>○ understand human needs;</li><li>○ be aware of how individuals' needs and behaviours may impact negatively on sustainable development; and</li><li>○ increase their intellectual literacy (English reading and writing) capacity.</li></ul>
<b>Intended Learning Outcomes</b>	<p>Upon completion of the subject, students will be able to:</p> <ul style="list-style-type: none"><li>(a) offer advice on measures to help create sustainable environments;</li><li>(b) apply sustainable features in building designs to help mitigate climate change;</li><li>(c) integrate the technological and social-economic issues for achieving sustainable development;</li><li>(d) critically consider the environmental and sustainable issues in individual and household dimensions; and</li><li>(e) write and read English effectively.</li></ul> <p>The stated learning outcomes relate to the three essential features of GUR subjects: namely literacy, higher order thinking, and life-long learning as follows:</p>

	<p>Sustainable development is a pattern of resource use that aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but in the indefinite future. It is a rather new concept and is a life-long issue. This subject requires extensive reading and writing assignments. The subject outcomes require students to read, write, consider, advise, apply and integrate issues from diverse perspectives. This provides students opportunities to gain competency in reading, writing, critical thinking, creative thinking and communication skills, and equips students with basic knowledge for life-long learning.</p>
<p><b>Subject Synopsis/ Indicative Syllabus</b></p>	<p>The issue of sustainability is very broad, embracing social, technological, economic and environmental aspects. This subject offers a good opportunity to combine students' knowledge from diverse fields in a coherent manner. The subject emphasizes the integration of the built, climatic and human components on creating sustainable living environments. The subject contents are aligned with the Pyramid for Sustainable Development as follows:</p> <p>Pyramid Base - Understanding the Needs</p> <ul style="list-style-type: none"> <li>○ <b>Our Environment:</b> Introduction to causes of climate change; projections of future climate change; overview of ecosystems; understanding the effects of climate change on ecosystems.</li> <li>○ <b>Human Needs:</b> Hierarchy of needs and consumer behaviour; characteristics of higher and lower order needs; relationship between consumer behaviour and environment.</li> <li>○ <b>Where-We-Live:</b> Key design decisions include location, size, and orientation of our homes, micro and macro environments, planning &amp; population projections, environmental impact.</li> </ul> <p>Second Tier - Identifying the Problems</p> <ul style="list-style-type: none"> <li>○ <b>Household Activities:</b> Understanding resources consumption and environmental loadings of household activities.</li> <li>○ <b>Socio-economic Impacts:</b> Understanding socio-economic impacts of resources consumption and environmental loadings associated with household activities.</li> </ul> <p>Pyramid Apex – Solutions</p> <ul style="list-style-type: none"> <li>○ <b>Built Features:</b> Sustainable construction; embodied energy; efficient use of materials; construction methods; windows and glazing; shading devices.</li> <li>○ <b>Materials Selection:</b> Low emission materials; materials with recycled content; timber from rapidly renewable sources.</li> <li>○ <b>Sustainable Systems:</b> Introduction of energy and water efficient appliances; alternative energy sources (clean energy sources, renewable energy technologies); water recycling.</li> </ul>

<b>Teaching/Learning Methodology</b>	<p>The subject will be delivered via seminars and workshops led by subject lecturers complimented with fieldwork. These activities lead towards a multi-disciplinary capstone project to develop a product or service for achieving sustainability.</p> <p>Students will need to consider whether sustainable strategies employed elsewhere can be applied in Hong Kong. Students' efforts include self-reading, writing of projects reports and presentation of their works in exhibitions/seminars.</p> <p>The seminars aim at introducing the students with the sustainable development pyramid and carbon footprint assessment with focus on our daily activities.</p> <p>The fieldwork aims at giving students experience of broad range of places in Hong Kong such as the Kadoorie farm, the wetland park, the traditional village, the Zero Carbon Building, or even commercial buildings to appreciate how new constructions and technologies integrate with the woodland, hills, and coastlines for betterment of sustainable development, and for promoting low carbon living in Hong Kong. Students will critically review the characteristics of different sites to assess the sustainable features seen, making recommendations by reference to an extensive reading (100,000 words or over 200 pages) for improvements where appropriate, via writing a site visits report of a minimum of 2500 words.</p> <p>With the basic understanding of the sustainable development pyramid, the workshops aim at teaching the students processes for collecting human needs data, prioritizing that data, developing a product /service specification, sketching and constructing product/service prototypes, etc.</p> <p>The multi-disciplinary group project aims to provide students with hands-on experience in "green" product development. Students will be asked to design and develop a product or service for achieving sustainability.</p> <p>The topics include:</p> <ul style="list-style-type: none"> <li>○ developing a cost-effective household program in greenhouse gas reductions;</li> <li>○ creating a house model with strategies in mitigating climate change;</li> <li>○ assessing human activities contributing to greenhouse gas emissions; and</li> <li>○ examining how built features, building materials and sustainable systems help sustain our environment.</li> </ul> <p>The physical set-ups, computer modelling, workshop facilities and the Eco-house in the Industrial Centre of the University (IC) will be made available to the students to support the project works. The instructors in IC will facilitate students to form mixed disciplinary teams for the development of their "green" product. Student efforts are needed to conduct an extensive literature search to understand sustainable practices in Hong Kong and elsewhere in the world; and present their ideas in the form of report writing and seminar presentation. The project report should contain no more than ten A4 sheets of text and fifteen A4/A3 sheets of drawings, sketches, calculations and data.</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)				
			a	b	c	d	e
	1. Quiz (Individual) - for ER requirement [10% marked by BEEE] - students must obtain a D or above on this assessment to pass the subject	10	✓	✓	✓	✓	✓
	2. Fieldwork Site visits report (Individual) - for EW requirement [30% marked by BEEE; 10% marked by ELC] - students must obtain a D or above on this assignment to pass the subject	40			✓	✓	✓
	3. Project Report (Group)	30	✓	✓	✓		
	Exhibition/ presentation (Individual)	10	✓	✓	✓		
	Progress (Individual)	10					
	<b>Total</b>	<b>100 %</b>					
<p><b>Quiz:</b></p> <p>The quiz will contribute to enable students becoming more familiar with the needs, the problems and the solutions for creating a sustainable living environment.</p> <p>The quiz also serves to assess students reading ability (ER requirement). Students are expected to conduct self-readings detailed on the reading list to familiar with the seminar topics.</p> <p><b>Site Visits Report for ER and EW requirement:</b></p> <p>The site visits report is to assess students' reading and writing ability. Students are expected to study the prescribed readings detailed on the Reading List to form their own objectives and investigations to complete the assignments. In addition, students will be required to:</p>							

	<p>i. view online a short lecture series focusing on writing strategies provided by ELC to strengthen their English writing skills to meet the “EW” requirement; and</p> <p>ii. undertake an interactive online learning resources developed by ELC on voluntary basis to enhance their English reading skills to meet the “ER” requirement.</p> <p><b>Project:</b></p> <p>The proposed project-based assessment method is appropriate for achieving the intended outcomes of this subject which relates directly to the three essential features of GUR subjects: namely literacy, higher order thinking, and life-long learning.</p> <p>Project-based assessment method is considered most suitable for motivating students to encounter the sustainable concepts and subject hands-on. Through engaging in design of a green product and writing of project report, students can develop their own research objectives and problem solving skills; and enhance their critical and creative thinking. More importantly, they can develop new learning and investigating habits.</p> <p>A list of topics in the area of Site aspects, Material aspects, Energy use, Water use, and Indoor environmental quality are proposed for Students’ considerations and selection. Sample reports are also given to students for their reference.</p>	
<b>Student Study Effort Expected</b>	Class contact:	
	▪ Seminar	12 Hrs.
	▪ Workshop/Meetings/Quiz	17 Hrs.
	▪ Fieldwork	4 Hrs.
	▪ Exhibition/Presentation	4 Hrs.
	Other student study effort:	
	▪ Self-reading	13 Hrs.
	▪ Site Visits Report	30 Hrs.
	▪ Project Development	25 Hrs.
	▪ Project Report and Exhibition/Presentation	15 Hrs.
	Total student study effort	120 Hrs.
<b>Reading List and References</b>	<p><b>Essential</b></p> <p>i. The following books are recommended for understanding the seminar topics:</p> <ul style="list-style-type: none"> <li>- Environmental Protection Department and the Electrical and Mechanical Services Department. Guidelines to Account for and Report on Greenhouse Gas Emissions and Removals for Buildings (Commercial, or Institutional Purposes) in Hong Kong, 2010 Edition (46 pages).</li> <li>- BEAM Society, BEAM Plus for New Buildings Version 1.2, 2012 (pages 1-26). Free download at:</li> </ul>	

<https://www.beamsociety.org.hk/files/download/download-20130724174420.pdf>

- BEAM Society, BEAM Plus for Existing Buildings Version 1.2,2012 (pages 1-23). Free download at:

<https://www.beamsociety.org.hk/files/download/download-20160331154515.pdf>

ii. The following book should be read for site visit report to recognise and critically analyse the performance of sustainable features of buildings:

- BEAM Society, BEAM Plus for New Buildings Version 2.2 9.2019 Free download at:

[https://www.beamsociety.org.hk/files/download/NBv2.0\\_FinalVersion\\_v2.2\\_20190904.pdf](https://www.beamsociety.org.hk/files/download/NBv2.0_FinalVersion_v2.2_20190904.pdf)

### **Supplementary**

- Sustainable Building Technical Manual. Free download at

[https://www.usgbc.org/sites/default/files/SustainableBuildingTechnicalManual\\_partii.pdf](https://www.usgbc.org/sites/default/files/SustainableBuildingTechnicalManual_partii.pdf)

- Los Alamos National laboratory, LANL Sustainable Design Guide, 2002. Free download at <http://engstandards.lanl.gov/esm/architectural/Sustainable.pdf>

- Touzard C, and Dupré F M, Going green in Hong Kong: tips and addresses for environmentally-friendly living in Hong Kong, Eco Control and Solution Ltd, 2007. GE199.C62 T68 2007

- US Department of Energy, The business case for sustainable design in federal facilities. Free download at

<https://www.energy.gov/sites/prod/files/2013/10/f3/bcsddoc.pdf>

- Additional materials such as papers published by the subject lecturers and coresearchers, and selected papers from international journals will be distributed in class.