

## Subject Description Form

Subject Code	<b>BSE455</b>
Subject Title	<b>Sustainable Buildings</b>
Credit Value	3
Level	4
Pre-requisite Co-requisite Exclusion	Nil Nil Nil
Objectives	<p>The issue of sustainability is very broad, embracing social, environmental and economic aspects. This subject deals with the issue of environmentally sustainable buildings, focussing on alleviating the major environmental impacts whilst sustaining living and working built environments. The subject aims to provide students with:</p> <ul style="list-style-type: none"> <li>• an understanding of concept of sustainability, the key aspects associated with buildings, and the impacts of buildings on the environment;</li> <li>• an understanding of how do design and specifications of buildings affect their life cycle environmental impacts;</li> <li>• the ability to quantify global, local and indoor environmental performance criteria and benchmarks, and their relationships with building regulations, environmental regulations, and other local codes and good practice guides; and</li> <li>• the ability to assess building designs against prescribed environmental performance criteria.</li> </ul>
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> <li>a) understand the need of environmental management and sustainable development;</li> <li>b) understand the impacts of buildings on sustainable development;</li> <li>c) apply the knowledge of BEAM Plus to protect the environment and sustainable social development;</li> <li>d) consider, analyse and evaluate built environmental issues related to use of material, energy and water use, safety, health and environment quality;</li> <li>e) report, interpret, assess and offer advice on criteria that defines ‘sustainability’ and referenced sustainable buildings; and</li> <li>f) benchmark building environmental performance against local and international standards and practices.</li> <li>g) undertake a benefit-cost analysis for improving a building’s environmental performance.</li> </ol>
Subject Synopsis/ Indicative Syllabus	<p><b>Sustainable buildings:</b> sustainability development; green and sustainable buildings; ecological footprint; environmental aspects and impacts; environmental management systems (ISO14000, etc); environmental sustainability indicators; life cycle assessment principles; health and safety issues.</p> <p><b>Outdoor environmental quality:</b> local regulations and codes; environmental impact assessment (EIA) in Hong Kong; environmental legislation; local good practice (ProPECC’s, etc); air quality; pollution from buildings; noise from buildings and systems; acoustic impact assessment; waste management, water and sewage, etc.</p>

	<p><b>Building environmental assessment:</b> assessment methods, aims and objectives, structure and focus, benchmarks, assessment criteria and weightings; global, regional, local and indoor environmental aspects; life cycle considerations, planning and design decisions, construction, commissioning and handover, etc, with particular emphasis on BEAM Plus..</p> <p><b>Site aspects:</b> Locations, Site planning and design, emissions from site.</p> <p><b>Materials aspects:</b> sustainable use of materials, selection of materials and waste management.</p> <p><b>Energy use:</b> energy use and energy efficient systems in buildings; local regulations and codes; green roof; vertical greenery</p> <p><b>Water use:</b> water use conservation in buildings, demand side management programmes; local regulations and codes, effluents.</p> <p><b>Indoor environmental quality:</b> thermal comfort; visual comfort and performance; lighting criteria; sound and noise; room acoustics; indoor air quality; mechanical and natural ventilation; local regulations and codes.</p> <p><b>Innovations and additions:</b> Techniques, performance enhancement and BEAM Professional.</p> <p><b>Costs and benefits for sustainable buildings:</b> business costs; productivity; procurement process; cost and benefits in design, construction, commissioning and handover; life-cycle costing.</p>																																																													
Teaching/Learning Methodology	Lectures will be supplemented with workshops and group projects for introducing the course. Video will be shown for explaining the concept of sustainability and building design.																																																													
Assessment Methods in Alignment with Intended Learning Outcomes	<table border="1" data-bbox="424 1039 1445 1594"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="7">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> <th>d</th> <th>e</th> <th>f</th> <th>g</th> </tr> </thead> <tbody> <tr> <td>1. Progress assessment I</td> <td>15</td> <td>√</td> <td>√</td> <td>√</td> <td></td> <td></td> <td></td> <td>√</td> </tr> <tr> <td>2. Progress assessment II</td> <td>15</td> <td></td> <td></td> <td></td> <td>√</td> <td>√</td> <td></td> <td></td> </tr> <tr> <td>3. Group Project</td> <td>10</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td>4. End-of-semester examination</td> <td>60</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td>Total</td> <td>100 %</td> <td colspan="7"></td> </tr> </tbody> </table> <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p>	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)							a	b	c	d	e	f	g	1. Progress assessment I	15	√	√	√				√	2. Progress assessment II	15				√	√			3. Group Project	10	√	√	√	√	√	√	√	4. End-of-semester examination	60	√	√	√	√	√	√	√	Total	100 %							
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	<ul style="list-style-type: none"> <li>▪ Group project</li> </ul>	20 Hrs.
	Total student study effort	98 Hrs.
Reading List and References	<p>Ed. W.S. Wong, E.H.W. Chan., Building Hong Kong – Environmental Considerations. Hong Kong University Press, 2000.</p> <p>BEAM Plus Version 1.2 for New Buildings and Existing Buildings, BEAM Society Limited (BSL); 2012..</p> <p>US Green Building Council, Sustainable Buildings Technical Manual, Green Building Design, Construction and Operations, 2006,</p> <p>Kibert, C.J. Sustainable Construction, Green Building Design and Delivery, Wiley, 2005.</p> <p>Health and Consumer Protection, EU, Scientific Committee on Health and Environmental Risks SCHER, Opinion on risk assessment on indoor air quality 2007.</p> <p>J Burnett, C K Chau, W.L. Lee, Cost and benefits of green and sustainable office buildings, Construction Industry Institute, 2009.</p> <p>Code of Practice for Energy Efficiency of Building Services Installations, EMSD, HKSAR Government; 2012.</p>	