

Subject Description Form

Subject Code	BSE5412
Subject Title	Indoor Environmental Quality Assessment
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	<ol style="list-style-type: none"> 1. To provide students with an overview of the factors affecting the indoor environment with respect to air quality, thermal comfort, lighting and acoustics. 2. To provide students with an understanding of the impact of indoor environmental quality on building performance. 3. To provide students with an understanding of the philosophy of indoor environmental assessment methods. 4. To provide students with practical experience on indoor environmental management.
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> a. identify the building systems and elements that affect the indoor environmental performance; and the parameters that describe the indoor environmental performance; b. understand the role of human factors in indoor environmental performance; c. study with competence the total indoor environmental quality with respect to building performance; d. assess indoor environmental performance with schemes like BEAM Plus and LEED; e. understand the management of the indoor environment in high performance buildings.
Subject Synopsis/ Indicative Syllabus	<p>Interaction between humans and the indoor environment: effect of indoor environmental quality on health, comfort and well-being. Aspects of indoor environmental quality and parameters used to describe performance: air, thermal, lighting and acoustics.</p> <p>Indoor air quality assessment and enhancement: Definition, Key monitoring parameters. Relationship between indoor air quality and comfort, health and productivity. Effect of material selection and system performance on indoor air quality; indoor air quality guideline; improvement strategies. Indoor air quality, ventilation and inter-unit dispersion in buildings.</p> <p>Thermal comfort: Human thermal comfort requirements. Effect of ventilation and space conditioning on thermal comfort. Methods for evaluating thermal comfort and indoor climate. Balancing thermal comfort and energy efficiency.</p> <p>Lighting: Principles of lighting; lighting systems; daylighting. Elements of a quality lighting environment. Energy considerations, sustainability, human factors, visual and non-visual needs. Effect of lighting on health and behavior. Assessment of indoor lighting quality.</p>

	<p>Acoustics: An introduction to acoustics, basic terminology and definitions of noise and vibration parameters. Sound and vibration generation and transmission; noise and vibration control concepts. Noise assessment including targets, parameters and improvement. Parameters include noise indices and reverberation time. Effects of noise on human beings including comfort, health and productivity.</p> <p>Rating of indoor environmental performance: BEAM Plus and LEED. Indoor environmental quality management strategies.</p>																																	
<p>Teaching/Learning Methodology</p>	<p>The subject teaching will be realized through lectures, seminars and tutorial sessions. These are to disseminate the theories and concepts of the subject as well as their applications in practical context. Selected case examples will be used in seminars and workshops to support and illustrate the theories and concepts. Students will be required to prepare coursework seminars on selected topics to achieve the intended learning outcomes.</p>																																	
<p>Assessment Methods in Alignment with Intended Learning Outcomes</p>	<table border="1" data-bbox="440 680 1390 1097"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="5">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> </tr> </thead> <tbody> <tr> <td>1. Coursework</td> <td>40%</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td>2. Examination</td> <td>60%</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td>Total</td> <td>100%</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					a.	b.	c.	d.	e.	1. Coursework	40%	√	√	√	√	√	2. Examination	60%	√	√	√	√	√	Total	100%					
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<p>Reading List and References</p>	<p>BEAM Society. <i>Building Environmental Assessment Method Plus – Existing Buildings</i>.</p> <p>BEAM Society. <i>Building Environmental Assessment Method Plus – New Buildings</i>.</p> <p>M. Mehta, J Johnson and J Rocafort (1999). <i>Architectural Acoustics, Principles and Design</i>.</p> <p>M. Stiller (2012). <i>Quality Lighting for High Performance Buildings</i>. Fairmont Press.</p> <p>P.M. Bluysen (2009) <i>The Indoor Environmental Handbook</i>. Earthscan.</p> <p>U.S. Green Building Council (2009). <i>LEED Reference Guide for Green Building Design and Construction</i>.</p>																																	