

## Subject Description Form

<b>Subject Code</b>	<b>BSE2868/IC268</b>
<b>Subject Title</b>	Essential Building Services Practices
<b>Credit Value</b>	3 Training Credits
<b>Level</b>	2
<b>Pre-requisite</b>	BSE269
<b>Objectives</b>	This subject helps students to relate the academic theories of traditional and advanced electrical and intelligent building technologies to real-world practices. This subject also provides students with the knowledge to manage operation of BIM projects. It is aimed for students, upon completion of this subject and BSE269, to attain professional competence equivalent to CIC-accredited BIM Manager (CCBM).
<b>Intended Learning Outcomes</b>	Upon completion of the subject, students will be able to: <ul style="list-style-type: none"> <li>a. apply appropriate practices to electrical systems with regards to building operation requirements and workplace safety;</li> <li>b. undertake design, installation, testing and commissioning of intelligent building control systems in buildings on the basis of recognizing the engineering standards, regulations and practices; and</li> <li>c. manage BIM uses and processes in construction.</li> </ul>
<b>Subject Synopsis/ Indicative Syllabus</b>	<p><u>Integrated Building Systems</u></p> <ul style="list-style-type: none"> <li>• Use of motion sensor with enable/disable switch;</li> <li>• Design of building systems, including lighting control, shutter control, and heating/cooling ventilation and air-conditioning (HVAC) system;</li> <li>• Design and implementation of PID control function loops;</li> <li>• Online and offline program monitoring and integration test;</li> <li>• Development of self-maintain BMS control system for building services applications; and</li> <li>• Mini-projects for realistic work applications.</li> </ul> <p><u>Electrical Installation Practice</u></p> <ul style="list-style-type: none"> <li>• Electrical workshop safety;</li> <li>• Code of Practice of Electrical Wiring Regulation; proper use of components; conduit;</li> <li>• Circuit arrangement; fluorescent lamp operation and installation; final circuit installation and arrangement;</li> <li>• Single-phase AC motor installation and control; and</li> <li>• Testing and commissioning for final circuits and sub-distribution circuits; procedures for inspection.</li> </ul> <p><u>BIM Advanced</u></p> <ul style="list-style-type: none"> <li>• BIM technology and applications in construction industry;</li> <li>• Building information modelling system conventions and standards such as model zone, model coordinate, model hierarchy, data structures, level of development (LOD), LOD responsibility matrix, model division etc.;</li> <li>• Digital information management, collaboration and integration; and</li> <li>• Commercial and contractual issues of BIM projects.</li> </ul>

<b>Learning Methodology</b>	<p>The subject will be delivered through the following learning methods:</p> <ol style="list-style-type: none"> <li>Mini-lectures – Lectures and demonstrations are used to introduce and explain key concept, definition and application of building services systems. Multi-media illustrations are used for students to appreciate the good practices and skills in real-life practices.</li> <li>Hands-on workshop - Students are arranged to have hands-on workshops to practice installation and system integration under supervision of IC training staff in workshops. A wide range of practices are demonstrated. Hands-on sessions are arranged, if appropriate, for students to practice the industry standards and techniques;</li> <li>Assignments - Individual assignments are arranged to strengthen students’ knowledge on building services; and</li> <li>Self-learning - Independent on-line learning materials are provided for students to broaden their horizon of industry’s latest practices and BIM technology and applications.</li> </ol>																																											
<b>Assessment Methods in Alignment with Intended Learning Outcomes</b>	<table border="1"> <thead> <tr> <th data-bbox="424 669 756 730">Assessment Method</th> <th data-bbox="764 669 935 763">Weighting (%)</th> <th colspan="3" data-bbox="935 669 1481 730">Intended Subject Learning Outcomes Assessed</th> </tr> <tr> <td></td> <td></td> <th data-bbox="935 730 1114 779">a</th> <th data-bbox="1114 730 1299 779">b</th> <th data-bbox="1299 730 1481 779">c</th> </tr> </thead> <tbody> <tr> <td data-bbox="424 779 764 819">Assignments</td> <td data-bbox="764 779 935 819">40</td> <td data-bbox="935 779 1114 819">✓</td> <td data-bbox="1114 779 1299 819">✓</td> <td data-bbox="1299 779 1481 819">✓</td> </tr> <tr> <td data-bbox="424 819 764 860">Reports</td> <td data-bbox="764 819 935 860">30</td> <td data-bbox="935 819 1114 860">✓</td> <td data-bbox="1114 819 1299 860">✓</td> <td data-bbox="1299 819 1481 860">✓</td> </tr> <tr> <td data-bbox="424 860 764 898">Tests</td> <td data-bbox="764 860 935 898">30</td> <td data-bbox="935 860 1114 898">✓</td> <td data-bbox="1114 860 1299 898">✓</td> <td data-bbox="1299 860 1481 898">✓</td> </tr> </tbody> </table>	Assessment Method	Weighting (%)	Intended Subject Learning Outcomes Assessed					a	b	c	Assignments	40	✓	✓	✓	Reports	30	✓	✓	✓	Tests	30	✓	✓	✓																		
Assessment Method	Weighting (%)	Intended Subject Learning Outcomes Assessed																																										
		a	b	c																																								
Assignments	40	✓	✓	✓																																								
Reports	30	✓	✓	✓																																								
Tests	30	✓	✓	✓																																								
<b>Student Study Effort Required</b>	<table border="1"> <thead> <tr> <th colspan="2" data-bbox="424 1200 948 1240"><b>Class Contact</b></th> <th colspan="3" data-bbox="948 1200 1481 1240"></th> </tr> </thead> <tbody> <tr> <td data-bbox="424 1240 948 1294">Mini lecture and demonstration</td> <td data-bbox="948 1240 1481 1294"></td> <td colspan="3" data-bbox="948 1240 1481 1294" style="text-align: right;">36.5* Hrs</td> </tr> <tr> <td data-bbox="424 1294 948 1348">Hands-on practice and test</td> <td data-bbox="948 1294 1481 1348"></td> <td colspan="3" data-bbox="948 1294 1481 1348" style="text-align: right;">56.5 Hrs</td> </tr> <tr> <th colspan="2" data-bbox="424 1348 948 1402"><b>Other Study Effort</b></th> <th colspan="3" data-bbox="948 1348 1481 1402"></th> </tr> <tr> <td data-bbox="424 1402 948 1456">Assignment and report</td> <td data-bbox="948 1402 1481 1456"></td> <td colspan="3" data-bbox="948 1402 1481 1456" style="text-align: right;">8 Hrs</td> </tr> <tr> <td data-bbox="424 1456 948 1509">Self-learning</td> <td data-bbox="948 1456 1481 1509"></td> <td colspan="3" data-bbox="948 1456 1481 1509" style="text-align: right;">4 Hrs</td> </tr> <tr> <td colspan="2" data-bbox="424 1509 948 1563"><b>Total Study Effort:</b></td> <td colspan="3" data-bbox="948 1509 1481 1563" style="text-align: right;"><b>105 Hrs</b></td> </tr> <tr> <td colspan="5" data-bbox="424 1563 1481 1695"> <p><b>*Remark: The contact hours are designed to satisfy Construction Industry Council (CIC) requirements on BIM Manager.</b></p> </td> </tr> </tbody> </table>				<b>Class Contact</b>					Mini lecture and demonstration		36.5* Hrs			Hands-on practice and test		56.5 Hrs			<b>Other Study Effort</b>					Assignment and report		8 Hrs			Self-learning		4 Hrs			<b>Total Study Effort:</b>		<b>105 Hrs</b>			<p><b>*Remark: The contact hours are designed to satisfy Construction Industry Council (CIC) requirements on BIM Manager.</b></p>				
<b>Class Contact</b>																																												
Mini lecture and demonstration		36.5* Hrs																																										
Hands-on practice and test		56.5 Hrs																																										
<b>Other Study Effort</b>																																												
Assignment and report		8 Hrs																																										
Self-learning		4 Hrs																																										
<b>Total Study Effort:</b>		<b>105 Hrs</b>																																										
<p><b>*Remark: The contact hours are designed to satisfy Construction Industry Council (CIC) requirements on BIM Manager.</b></p>																																												

<b>Reading List and References</b>	<p><b>Reading Materials:</b></p> <ul style="list-style-type: none"><li>• IC Training Materials and Presentation for Construction Students (<a href="http://www2.ic.polyu.edu.hk/bcu/learningmaterialspowerpoints.html">http://www2.ic.polyu.edu.hk/bcu/learningmaterialspowerpoints.html</a>)</li><li>• Construction Industry Council BIM Publications (<a href="https://www.bim.cic.hk/en/resources/publications">https://www.bim.cic.hk/en/resources/publications</a>)</li></ul> <p><b>References:</b></p> <ul style="list-style-type: none"><li>• EMSD, Code of Practice for the Electricity (Wiring) regulations, 2015 Edition.</li><li>• IET wiring regulation, 18th edition.</li><li>• EMSD, Building Energy Code, 2018 Edition</li><li>• EMSD, Energy Audit Code, 2018 Edition</li></ul>
------------------------------------	---