

## Subject Description Form

Subject Code	<b>BSE2505</b>
Subject Title	<b>Engineering Management and Building Information Modeling</b>
Credit Value	3
Level	2
Pre-requisite Co-requisite Exclusion	Nil Nil Nil
Objectives	<ol style="list-style-type: none"> <li>1. Familiarise students with contract administration in building services engineering works.</li> <li>2. Enables students to understand and apply management science techniques and procedures to the practice of building services engineering.</li> <li>3. Enables students to appreciate the use of Building Information Modelling and related computer based techniques for documentation and modelling of building designs</li> </ol>
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 logic, benefits and drawbacks of various forms of procurement, tendering, and contractual arrangements for a building services engineering project;</li> <li>b) understand the legal rights, obligations, responsibilities and liabilities in the provisions in the standard forms of building services contract, and disputes resolution mechanisms;</li> <li>c) acquire basic understanding of management science techniques for project management;</li> <li>d) acquire basic understanding of the recent development in Building Information Modelling and acquire basic Building Information Modelling software skills.</li> </ol>
Subject Synopsis/ Indicative Syllabus	<p><b>A review of project procurement methods adopted by the Hong Kong construction and facility management sectors:</b> conventional contractual arrangement, design and build, management contracting, project management, build-operate-transfer, etc.</p> <p><b>Tendering and estimating:</b> Introduction to tender documentation and tendering process; competition and negotiation; contractor selection and nomination; quantity surveying practice for building services installation; bills of quantities; unit rate build-up, sub-contract work, preliminaries and temporary works.</p> <p><b>Contractual arrangements:</b> Types of building contracts and sub-contracts; contractual arrangements; contract documentation; standard form of contracts and sub-contracts; rights and obligations of contracting parties; architects instructions; possession of site; practical completion; defects rectification and liability; variations, reimbursement of loss and expense; recovery of fluctuations; insurance. Contract stages and procedures; planning and programming of work; statutory requirement; liaison with statutory bodies and authorities; contract payments and accounts.</p> <p><b>Resolution of disputes:</b> Contract provisions and procedures for arbitration and mediation; litigation; alternative dispute resolution.</p> <p><b>Application of management science principles and techniques for project management, planning and control:</b> Project management techniques; Gantt charts, network flow models; cash flow planning; cost, time and resource planning and control; understanding of project management software in control process &amp; lifecycle costing analysis; decision tree, decision making and risk analysis.</p> <p><b>A review and application of Building Information Modelling and related computer based techniques for building services engineering design and documentation:</b> Revit as an example of BIM application, parametric modelling, BIM for design collaboration and decision-making.</p>

Teaching/Learning Methodology	A problem based approach will be adopted in the delivering of this subject. Contact sessions will comprise a combination of lectures, tutorials/mini-workshops. Case studies will be given for students to work in groups to solve real-life problems.								
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			
	In-class assessment I	20	✓	✓	✓				
	Group Project	20				✓			
	Coursework*	60	✓	✓	✓	✓			
	Total	100 %							
* For details, please refer to the 2020/21 Semester 1 Subject teaching scheme/schedule. Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:									
Student Study Effort Expected	▪ Class contact:								
	▪ Lectures		26 Hrs.						
	▪ Workshop/Group Project		11 Hrs.						
	▪ In-class assessments		2 Hrs.						
	Other student study effort:								
	▪ Self study		60 Hrs.						
	▪ Self-learning for computer package		21 Hrs.						
	Total student study effort		120 Hrs.						
Reading List and References	<p>Ashworth, A. Contractual Procedures in the Construction Industry, Prentice Hall.</p> <p>Ashworth, A. Pre-contract Studies: Development Economics, Tendering and Estimating, Blackwell.</p> <p>Hills, M. Building Contract Procedures in Hong Kong, Longman.</p> <p>Taylor III, B.W. Introduction to Management Science, Prentice Hall.</p> <p>McGraw Hill Construction, 2008, Building Information Modelling (BIM): Transforming Design and Construction to Achieve Greater Industry Productivity, New York, United States.</p> <p><b>Wallace, I.N.D. Hudson's Building and Engineering Contracts: including the duties and liabilities of architects, engineers and surveyors</b>, Sweet &amp; Maxwell.</p> <p>Agreement &amp; Schedule of Conditions of Building Contract for use in the Hong Kong Special Administrative Region, Standard Form of Building Contract - With Quantities, 2005 Edition.</p>								