Subject Description Form

Subject Code	**BSE3512**
Subject Title	**Engineering Management**
Credit Value	3
Level	3
Pre-requisite Co-requisite Exclusion	Nil Nil Nil
Objectives	1. Aims to familiarise students with contract administration in building services engineering works. works. 2. Enables students to understand and apply management science techniques and procedures to the practice of building services engineering. 3. Give students a practical, hands-on introduction to Building Information Modelling and related computer based techniques for the documentation and modelling of building design
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a) identify benefits and drawbacks of various forms of procurement, tendering, and contractual arrangements for a building services engineering project; b) explain the logic behind the tendering and estimating procedures for building services installation; c) explain the legal rights, obligations, responsibilities and liabilities in the provisions in the standard forms of building services contract; d) describe various means of disputes resolution mechanisms in the construction industry ; e) apply cost, time and resources control for building services installation in construction projects; and f) apply management science techniques for project management; g) understand recent development in Building Information Modelling and be able to translate this knowledge into their own professional background; h) gain hands-on modelling and analytical skills and are able to use a range tools to conduct modelling and analysis work as well as team collaboration practices.
Subject Synopsis/ Indicative Syllabus	**A review of project procurement methods adopted by the Hong Kong construction and facility management sectors:** conventional contractual arrangement, design and build, management contracting, project management, build-operate-transfer, etc. **Tendering and estimating:** 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. **Contractual arrangements:** 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. **Resolution of disputes:** Contract provisions and procedures for arbitration and mediation; litigation; alternative dispute resolution. **Application of management science principles and techniques for project management, planning and control:** 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 & lifecycle costing analysis; decision tree, decision making and risk analysis. **A review and application of Building Information Modelling and related computer based**

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<tr><td></td><td>techniques for building design and documentation: Revit as an example of BIM application, parametric modelling, BIM for design collaboration and decision-making.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>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.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a-c</td><td>d-e</td><td>f</td><td>g</td><td>h</td><td></td></tr>
<tr><td>In-class assessment I</td><td>20</td><td>✓</td><td></td><td>✓</td><td></td><td></td><td></td></tr>
<tr><td>Group Project</td><td>20</td><td></td><td></td><td></td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>End-of-semester examination</td><td>60</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>Total</td><td>100</td><td colspan="6"></td></tr>
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Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes.
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<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lectures</td><td>28 Hrs.</td></tr>
<tr><td>▪ Workshop/Group Project</td><td>9 Hrs.</td></tr>
<tr><td>▪ In-class assessments</td><td>2 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Self study</td><td>60 Hrs.</td></tr>
<tr><td>▪ Self-learning for computer package</td><td>21 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>120 Hrs.</td></tr>
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<tr><td>Reading List and References</td><td>

Ashworth, A. Contractual Procedures in the Construction Industry, Prentice Hall.
Ashworth, A. Pre-contract Studies: Development Economics, Tendering and Estimating, Blackwell.
Hills, M. Building Contract Procedures in Hong Kong, Longman.
Taylor III, B.W. Introduction to Management Science, Prentice Hall.
McGraw Hill Construction, 2008, Building Information Modelling (BIM): Transforming Design and Construction to Achieve Greater Industry Productivity, New York, United States.
Wallace, I.N.D. Hudson's Building and Engineering Contracts: including the duties and liabilities of architects, engineers and surveyors, Sweet & Maxwell.
Agreement & Schedule of Conditions of Building Contract for use in the Hong Kong Special Administrative Region, Standard Form of Building Contract - With Quantities, 2005 Edition.

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