Subject Description Form

Subject Code	**BSE3514**
Subject Title	**Engineering Management and Decision Making in Construction**
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. 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 including multivariate decision making methods for project procurement and tendering;. g) apply operational management science techniques for project management
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.
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.

<table>
<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</td><td>e</td><td>f</td><td>g</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>In-class assessment II</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="5"></td></tr>
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Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

i) In-class assessments (I & II) requiring the students to demonstrate their ability in attaining the intended outcomes a-d & e-g, are an interim assessment on their individual learning progress.
ii) Final examination, which carries the largest assessment component, is to assess the overall ability of individual students in attaining the various intended 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>26 Hrs.</td></tr>
<tr><td>▪ Workshop Project</td><td>9 Hrs.</td></tr>
<tr><td>▪ In-class assessments</td><td>4 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. 7th edition, 2018.

Ashworth, A. Pre-contract Studies: Development Economics, Tendering and Estimating, Blackwell, 3rd edition, 2008.

Taylor III, B.W., Introduction to Management Science, Prentice Hall, 13th edition, 2019.

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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