

## Subject Description Form

<b>Subject Code</b>	BRE345
<b>Subject Title</b>	Measurement, Documentation & Estimating
<b>Credit Value</b>	3
<b>Level</b>	3
<b>Pre-requisite</b>	BRE261
<b>Objectives</b>	<p>This subject is intended to:</p> <ol style="list-style-type: none"> <li>1. Enable students to understand the construction process and sequence of building works.</li> <li>2. Enable students to appreciate the building measurement rules as stipulated in standard method of measurement.</li> <li>3. Enable students to develop the skills required for measuring, quantifying, and pricing construction work.</li> <li>4. Enable students to develop the understanding of tendering procedures with reference to producing and checking tender documentation.</li> </ol>
<b>Intended Learning Outcomes</b>	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> <li>(a) Describe the construction process and sequence of new building works.</li> <li>(b) Measure the new building works in accordance with the standard method of measurement.</li> <li>(c) Synthesise and analyse the composition of unit rate and tender price.</li> <li>(d) Prepare, examine, and compare documentation to be used in procurement of building works.</li> </ol>
<b>Subject Synopsis/ Indicative Syllabus</b>	<p><i>Building measurement for building works:</i></p> <p>Organisation and systems of measurement including divisions of building works and building trades; mensuration used in measurement; measurement techniques for building works; comparative studies of measurement procedures; measurement using computers; composition of bills of quantities; composition of tender documents; and appreciation of forward trends.</p> <p><i>Tender documentation for building works:</i></p> <p>Communication between client, designer, and contractor; types of tender documentation and their application; use of bills of quantities, drawings and specifications, preambles, preliminaries, queries; methods of project delivery; types of building contract; procedure of tendering.</p> <p><i>Cost estimating for building works:</i></p> <p>Factors influencing the pricing of new building works; evaluation of unit rate based on resources (labour, plant, and material); enquiries for cost rates; and calculation of unit rates for pricing tenders.</p>
<b>Teaching/Learning Methodology</b>	<p>Theories and rationales will be delivered in lecture periods. In-class exercises will be given in lecture periods. Practical knowledges and experiences will be shared and delivered in tutorial periods. E-learning materials and e-discussion forums will be provided. Building measurement software trainings will be delivered in the workshops. Guest lectures will be arranged to introduce the professionalism of surveyors and engineers in Hong Kong construction industry.</p>

**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		
1. Coursework 1: Individual assignment (taking off exercise, preparing bills of quantities)	15%	√	√				
2. Coursework 2: Individual assignment (taking off exercise, preparing bills of quantities, pricing bills of quantities)	15%	√	√	√			
3. Coursework 3: Group project (documentation and estimating problems)	20%			√	√		
4. Examination	40%	√	√	√	√		
5. Effort	10%	√	√	√	√		
Total	100%						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

**Coursework 1, Coursework 2**

Coursework 1 and Coursework 2: Students are given assignments (taking off exercise) for measuring the building works using the provided construction drawings. Coursework 1 and Coursework 2 are to assess students' ability:

- (i) To identify and familiarise with the building components through reading construction drawings.
- (ii) To understand the construction activities and sequence.
- (iii) To gather the necessary work and cost information.
- (iv) To develop the bills of quantities in standardised format.

Upon completion of Coursework 1 and Coursework 2, students will be able to achieve learning outcomes (a), (b) and (c).

**Coursework 3**

Coursework 3: Students are given a group project to solve the tender documentation and cost estimating problems. This coursework is to assess students' ability:

- (i) To organize themselves and fellow group members because a surveyor or an engineer work with others as a team to accomplish the estimating and tendering tasks.
- (ii) To use technical terminologies for work quantification, cost estimation and tender documentations.
- (iii) To solve a problem or task that is given (e.g., by your employer).
- (iv) To demonstrate presentation, communication and writing skills.

	<p>Through the problem-solving exercises relating to documentation and estimating activities (Coursework 3), students will be able to achieve learning outcomes (c) and (d).</p> <p>Examination is used to assess students' understanding of building measurement, cost estimating, and tender documentation concepts and practices learned in the lectures and tutorials. Students will be able to achieve learning outcomes (a), (b), (c), and (d).</p> <p>Through students' effort in solving the problem exercises given in lectures and tutorials, the students will be able to achieve learning outcomes (a), (b), (c), and (d).</p>	
<b>Student Study Effort Expected</b>	Class contact:	
	<ul style="list-style-type: none"> <li>▪ Lectures</li> </ul>	26 Hrs.
	<ul style="list-style-type: none"> <li>▪ Seminars / Tutorials</li> </ul>	13 Hrs.
	Other student study effort:	
	<ul style="list-style-type: none"> <li>▪ Student study effort</li> </ul>	120 Hrs.
	Total student study effort	159 Hrs.
<b>Reading List and References</b>	<p>Ashworth, A. and Hogg, K. (2007). <i>Willis's practice and procedure for the quantity surveyor—12<sup>th</sup> edition</i>. Blackwell, Oxford.</p> <p>Buchan, R., Fleming, F.W., and Grant, F.E. (2003). <i>Estimating for builders and surveyors—2<sup>nd</sup> edition</i>. Butterworth-Heinemann, Oxford.</p> <p>Chan, C.T.W. (2020). <i>Estimating and measurement for simple building works in Hong Kong</i>. Routledge.</p> <p>Holroyd, T.M. (2000). <i>Principles of estimating</i>. Thomas Telford, London.</p> <p>Packer, A.D. (1996). <i>Building measurement</i>. Addison Welsey Longman, Essex.</p> <p>Picken, D.H. and Drew, D.S. (1996). <i>Building measurement in Hong Kong: Worked Examples</i>. Longman Asia Ltd., Hong Kong.</p> <p>The Hong Kong Institute of Surveyors (2018). <i>Hong Kong standard method of measurement of building works—4<sup>th</sup> revised edition (HKSMM4R)</i>. The Hong Kong Institute of Surveyors, Hong Kong.</p>	