

## Subject Description Form

<b>Subject Code</b>	BRE324
<b>Subject Title</b>	Engineering Economics
<b>Credit Value</b>	3
<b>Level</b>	3
<b>Pre-requisite / Co-requisite/ Exclusion</b>	Nil
<b>Objectives</b>	<p>Engineers are members of one of the principal ‘spending professions’ in the sense that they carry responsibility for the design and production of infrastructure and the built environment. Economic analysis as applied to engineering and construction is concerned with pursuing the better use of resources, and providing the analytical support for decisions about achieving value for money and choosing between competing alternatives that will give us a sustainable future.</p> <p><i>This subject is intended to:</i> Equip students with theories and analytical skills necessary to make well informed decisions.</p>
<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. Identify, structure and analyse diverse problems arising from the changing social, economic, environmental and technological pressures</li> <li>b. Evaluate alternative strategic options</li> <li>c. Describe the size and market structure of the property and construction industries are and consequently to understand why construction and real estate has played an important role on economic development, particularly in the case of Hong Kong</li> <li>d. Undertake financial feasibility of engineering projects</li> <li>e. Possess skills to identify, analyse and solve problems</li> <li>f. Contribute as team member and to lead effectively</li> </ol>
<b>Subject Synopsis/ Indicative Syllabus</b>	<p><i>Engineering/Construction Economics:</i> Relationship between the construction and engineering sector and the economy. Globalization of capital markets. Demand for construction. Pricing mechanism for construction or engineering projects. Financial aspects of different contract strategies. Design economics. Whole life costing. Value Management.</p> <p><i>Principles of Project Appraisal:</i> Time value of money. Net present value and internal rate of return. Project investment appraisal and feasibility studies.</p> <p><i>Risk and Uncertainty:</i> Capital budgeting. Risk analysis and estimation of risk premiums, Probabilistic techniques for project appraisal. Weighted average cost of capital.</p> <p><i>Budgeting and Cost Control:</i> Cumulative expenditure and revenue curves. Design and production cost control.</p> <p><i>Cost and Break-even Analysis:</i> Fixed costs, variable costs. Working capital. Cost control curves. Calculation of break-even point.</p>

**Teaching/Learning Methodology**

**1<sup>st</sup> seven weeks**

Students spend half of their total contact hours in mass lectures, and another half in seminars. Lectures are interactive and students are encouraged to participate in discussions. Topics are introduced in the lectures and the key issues highlighted as well, supplemented with further learning and reference materials downloaded from the web. Subsequent seminars provide the opportunity for more in-depth discussion of the main issues delivered in the lectures. Themes of the seminars will follow closely that of the lectures, so that the framework introduced in the lecturers can be further illustrated, exemplified and elaborated.

**2<sup>nd</sup> seven weeks**

- Interactive lectures with discussions and Q&A to test students understanding before starting a new topic
- Use of videos to introduce concepts and pose discussions during tutorials
- Quiz to test students understand on this subject
- Sharing and discussions in tutorials
- Use both local and overseas real-life case studies to facilitate understanding and appreciation of real-life practices

**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	e	f
1. Group project	25%	√	√	√	√	√	√
2. Quiz	25%	√	√			√	
3. Examination	50%	√	√	√	√	√	
Total	100 %						

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

**1<sup>st</sup> seven weeks**

To access the learning outcome of “financial feasibility of engineering projects”, students did a group project modified from sample questions of the Chartered Financial Analyst Institute. A pass in this assignment would demonstrate their ability to apply their knowledge in financial analysis at a level that is commensurate with that required by an international professional body.

**2<sup>nd</sup> seven weeks**

To access the learning outcome of various topics covered in the 2<sup>nd</sup> seven week, students did quiz at the end of the 7<sup>th</sup> lecture in order to assess their overall learning for different topics. A pass in this quiz (would demonstrate their ability to apply their knowledge in using various tools for construction/infrastructure project assessment.

<b>Student Study Effort Expected</b>	Class contact:	
	• lectures	21Hrs.
	• tutorials	21Hrs.
	Other student study effort:	
	• reading from recommended texts / materials provided in e-learning system	23 Hrs.
	• group project / quiz preparation	55 Hrs.
	Total student study effort	120 Hrs.
<b>Reading List and References</b>	<p>Ashworth A. (2010) “<i>Cost Studies of Buildings</i>”, Pearson.</p> <p>Harris F., McCaffer, R. &amp; Edum-Fotwe, F. (2006) “<i>Modern Construction Management</i>”, Blackwell.</p> <p>Kelly J., Male S. &amp; Graham D. (2004) “<i>Value Management of Construction Projects</i>”, Blackwell Science.</p> <p>Kelly J., Morledge R. &amp; Wilkinson S. (2002) “<i>Best Value in Construction</i>”. Blackwell Science.</p> <p>Pilcher R. (1994) “<i>Project Cost Control in Construction</i>”, BSP.</p> <p>Poon T.N.T. &amp; Chan E.H.W. (1998) “<i>Real Estate Development in Hong Kong</i>”, PACE.</p> <p>Raftery J. (1994) “<i>Risk Analysis in Project Management</i>”, E &amp; FN Spon.</p> <p>Tang S.L. (2003) “<i>Economic Feasibility of Projects: Managerial and Engineering Practice</i>”, Chinese University Press.</p> <p><i>Various materials provided in the designated e-learning management system.</i></p>	