Subject Description Form

Subject Code	BRE4281
Subject Title	Construction Engineering Management
Credit Value	3
Level	4
Pre-requisite / Co-requisite/ Exclusion	Pre-requisite: BRE350 – Project Management and Procurement Co-requisite / Exclusion: Nil
Objectives	This subject is intended to develop the students' ability to apply decision making theories and operational research techniques in the management of construction projects.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. identify and diagnose management problems accurately and effectively across a wide range of construction engineering activities, including management practices, human resources and plant management, operations, and strategic management. b. formulate construction engineering management problems into analytical models. c. find out and plan sound solutions from various analytical models by using quantitative (operational research) techniques.
Subject Synopsis/ Indicative Syllabus	Construction productivity measurement and analysis Site management and method statements Fast track construction systems Construction plant and materials management Risk management for construction projects Construction management practices in Mainland China Linear and dynamic programming techniques and applications Decision theory and applications Inventory control theory and applications Monte Carlo simulation and applications
Teaching/Learning Methodology	Student learning will be facilitated through a combination of self-study and class contact sessions. The self-study will include guided reading, library searching skills, problem solving, reflection and textual & graphical communication as individuals and as part of a group. Some assignments will involve the training and development of problem analysis and presentation of results. Class contact will include lectures for providing an overall framework to topic areas and for those areas where textbooks do not provide adequate coverage. Small group sessions will be used for a combination of student-led seminars, role plays and workshop exercises for skill development and the raising of ethical awareness.

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	
1. Continuous assessment	50%	√	√	√			
2. Examination (2 hours)	50%	√	√	√			
Total	100 %						

The subject will be assessed on both a continuous basis and a close-book written examination. Coursework and examination will constitute equal parts of the overall marks of the subject respectively. The coursework mark will be based on role play, seminar discussion, presentation, workshops and problem-based assignments. Marks will be allocated on group and individual basis.

The individual problem-based assignments and group assignment presentations attempt to test the level of students' knowledge and application of various decision making theories and operational research techniques to construction projects, and then to determine the best option or the most optimal solution for implementation with strong justifications or sound recommendations.

Typical coursework assessment criteria include:

- logical structure;
- clarity and depth of thought;
- quality of written presentation;
- knowledge and information;
- problem analysis skills;
- oral and visual presentation skills;
- participation and leadership.

The exam questions attempt to test students' knowledge and understanding of various decision making theories and operational research techniques to construction projects, and then to suggest the most desirable strategies with justified arguments.

Student Study Effort Expected

Class contact:	
▪ Lectures	21 Hrs.
▪ Tutorials / Seminars	21 Hrs.
Other student study effort:	
▪ Self learning and recommended reading	120 Hrs.
▪	Hrs.
Total student study effort	162 Hrs.

Reading List and References

Recommended:

Chan D.W.M. and Kumaraswamy M.M. (1995) "A Study of the Factors Affecting

Construction Durations in Hong Kong". *Construction Management and Economics*, 13(4), July, 319-333.

Chan D.W.M. and Kumaraswamy M.M. (1995) "Effects of Technology and Site Productivity on Construction Times of Building Projects in Hong Kong". *Proceedings of the 16th Annual ASEM Conference*, American Society for Engineering Management, 21-23 September 1995, Washington DC, USA, 309-316.

Dai J.K., Goodrum P.M. and Maloney W.F. (2007) "Analysis of Craft Workers' and Foremen's Perceptions of the Factors Affecting Construction Labour Productivity". *Construction Management and Economics*, 25(11), November, 1137-1150.

Harris F. and McCaffer R. (2001) *Modern Construction Managemen*t, 5th Edition, Blackwell Science: Oxford

Kumaraswamy M.M. and Chan D.W.M. (1995) "Determinants of Construction Duration". *Construction Management and Economics*, 13(3), May, 209-217.

Olomolaiye P.O., Jayawardane A.K.W. and Harris F.C. (1998) *Construction Productivity Management*, Addison Wesley Longman, Edinburgh, England: Chartered Institute of Building.

Render Barry (1997) Quantitative Analysis for Management. Upper Saddle River, N.J.: Prentice Hall, 6th Edition, Longman Ltd., Ascot, England: Chartered Institute of Building

Shen L.Y., Lu W.S., Li H. and Shen Q.P. (2003) "Computer-aided decision support system for assessing contractor's competitiveness", *Journal of Automation in Construction* Vol. 12, No.5, 577-587.

Shen L.Y., Li Q.M. and Li H. (2002) 'Alternative concession model for BOT-contract project', *Journal of Construction Engineering and Management, ASCE*, 128(4), 326-331.

Shen L.Y, Wu M. and Wang J.Y. (2002) 'A model for assessing the feasibility of construction project in contributing to the attainment of sustainable development', *Journal of Construction Research*, Vol. 3, No.2, 255-271.

Shen L.Y., Wu W.C., Ng S.K. (2001) 'Risk Analysis for Construction Joint Ventures in China' *Journal of Construction Engineering and Management, ASCE*, 127(1), 76-82.

Shen L.Y., Drew D., Zhang Z.H. (1999) 'An Optimal Bidding Model for Price-Time Bi-parameter Construction Contracts' *Journal of Construction Engineering and Management, ASCE*, Vol. 125, No.3, pp.204-209.

Fisher N. and Shen L.Y. (1992) *Information Management within a Contractor - a Model for the Flow of Data* Thomas Telford Publications, U.K., ISBN 0-7277-1666-2 (This book is based on the research studies 'information management system for construction companies'), pp.260.

Shen L.Y. (1999) 'Risk Management', *Building in Value: Pre-design Issues*, (Ed., Best & De Valence) Arnold Publishers, ISBN: 0340741600, pp.248-267.

Tang S.L., Ahmad I.U., Ahmed S.M. and Lu M (2004) *Quantitative Techniques for Decision Making in Construction*, Hong Kong University Press: Hong Kong.

	Journals: *Hong Kong Engineer: The Journal of The Hong Kong Institution of Engineers*, Printers' Circle Ltd *Journal of Building and Construction Management*, CIOB(HK), HKIE (Building Division) and ACMA *Australian Institute of Building Papers*, AIB *Construction Management and Economics*, Routledge, Taylor & Francis *Engineering, Construction and Architectural Management*, Emerald *Facilities*, Emerald *HKIE Transactions*, Henderson & Associates *Journal of Construction Engineering and Management*, ASCE *Journal of Facilities Management*, Emerald *Journal of Management in Engineering*, ASCE *International Journal of Construction Management* *International Journal of Project Management*, Elsevier *Building and Environment*, Elsevier *Building Research and Information*, Routledge, Taylor & Francis