

## Subject Description Form

<b>Subject Code</b>	BRE210
<b>Subject Title</b>	Information and Data Analysis
<b>Credit Value</b>	3
<b>Level</b>	2
<b>Pre-requisite / Co-requisite / Exclusion</b>	Nil
<b>Objectives</b>	This subject is intended to develop the ability of students to understand and apply statistical concepts and computer & IT software packages in manipulating data for presentation, analysis, information modelling and decision-making throughout the process of construction and real estate developments.
<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. Apply the knowledge of fundamental statistics in collecting, organizing, summarizing, presenting and analyzing data, as well as drawing valid conclusions.</li> <li>b. Use computer information management /modelling systems to search information, analyze and building up information models, as well as make reasonable decisions.</li> <li>c. Communicate effectively and work in collaboration with other members of the project team in a professional context.</li> <li>d. Adopt professional skills to identify, analyze and solve problems.</li> </ol>
<b>Subject Synopsis/ Indicative Syllabus</b>	<p><b>Information Technology</b>  Introduction to computers, networks and information systems.  Searching on the Internet in knowledge world.  Construction IT and CAD drawings.  Building Information Modelling (BIM).  Computer applications in information control / electronic documentation.  Construction integrated management system and web-based project management.  E-commerce, E-tendering and knowledge management.  Introduction to profession-specific information systems for building surveying, construction management, quantity surveying and real estate.</p> <p><b>Data Analysis</b>  Descriptive statistics.  Probability theory.  Random variables and probability distribution functions.  Sampling theory and sampling distributions.</p>
<b>Teaching/Learning Methodology</b>	Lectures will be used to present essential concepts and principles of the various subject areas. Tutorial and laboratory sessions, where appropriate, will be used for discussion, problem-solving, hands-on demonstration and presentation. Interactive multimedia self-accessed learning materials will be provided via the department's computer network (e.g. LEARN@PolyU blackboard subject websites).

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. Continuous assessment	100%	√	√	√	√		
Total	100%							
<p>The subject will be assessed on a continuous basis and no examination is required. Information technology (50%) and data analysis (50%) will constitute equal proportions of the total coursework mark of the subject (100%). Students must complete and pass each of the two assessment components of the subject in order to obtain an overall pass of the subject. Fifty percent (50%) of the total coursework mark will be devoted to a test on data analysis component, and the other 50% to information technology component. The total coursework mark will be based on a portfolio comprising a series of problem-based assignments, written tests, group reports and presentations. Marks will be allocated on both group effort and individual basis.</p> <p>The problem-based assignments, written tests, group reports and presentations attempt to test the level of students' knowledge and application of fundamental statistical concepts and computer programs/ information management systems, in manipulating data for presentation, analysis and decision-making throughout the process of construction and real estate developments. Effectiveness of communication and teamwork, together with the application of professional skills in problem solving, will also be tested through all these assessment tools.</p>								
Student Study Effort Expected	Class contact:							
	▪ Lectures	26 Hrs.						
	▪ Tutorials / Laboratory sessions	13 Hrs.						
	Other student study effort:							
	▪ Self-learning and recommended reading	80 Hrs.						
	Total student study effort		119 Hrs.					

## Reading List and References

### Recommended:

#### Information Technology

Construction Industry Computing Association (1995). *Building IT 2005: A Multimedia Presentation of Experts' View on Information Technology in the Construction Industry to the Year 2005*. CICA.

Derfler, F.J. and Freed, L. (2005). *How Networks Work*. 7<sup>th</sup> Edition, Indiana.

Krol, E. and Klopfenstein, B. (1996). *The Whole Internet: User's Guide and Catalog*. O'Reilly, California, USA.

Wong, A.K.D. (2006). "Use of Smart Card for Enhancing Construction Site Human Resources Management". *Journal of Building and Construction Management*, Volume 10, Number 1, June, ISSN 1024-9540, 63-68.

Wong, A.K.D. (2006). "E-tendering in Anti-corruption in the Hong Kong Construction Industry". *Proceedings of the CIB W89 BEAR (Building Education and Research) 2006 International Conference on Construction Sustainability and Innovation*, 10-13 April 2006, Hong Kong, Abstract on page 93.

Wong, A.K.D., Wong F.K.W. and Abid Nadeem (2009). "Attributes of Building Information Modelling and its Development in Hong Kong". *The HKIE Transactions*, Volume 16, Number 2, June, ISSN 1023-697x, 38-45.

Wong K.D., Wong K.W. and Abid Nadeem (2010). "Attributes of Building Information Modelling Implementation in Various Country". *Journal of Architectural Engineering and Design Management - Special Issue in Integrated Design and Delivery Solutions*, Volume 6, Number 4, November, ISBN 978-1-84971-275-0, 288-302.

Wong K.D., Wong K.W. and Abid Nadeem (2011). "Government Roles in Implementing Building Information Modelling Systems: Comparison between Hong Kong and the United States". *Journal of Construction Innovation: Information, Process, Management*, Volume 11, Number 1, January, 61-76, Emerald Group Publishing Limited 1471-4175, DOI 10.1108/14714171111104637.

Wong K.D., Wong K.W. and Abid Nadeem (2011). "Building Information Modelling for Tertiary Construction Education in Hong Kong". *Journal of Information Technology in Construction (ITcon)*, Volume 16, 467-476, <http://www.itcon.org/2011/27>.

*Journal of Information Technology in Construction (ITcon)*: <http://www.itcon.org>

#### Data Analysis

Berenson, M.L., Levine, D.M. and Szabat, K.A. (2015). *Basic Business Statistics – Concepts and Applications*, 13<sup>th</sup> Edition, Pearson Education, Boston, USA.

Bland, J.A. (1985). *Statistics for Construction Students*, Construction Press.

Devore, J.L. (2016). *Probability and Statistics for Engineering and the Sciences*, 9<sup>th</sup> Edition, Cengage Learning, Boston, USA.

Lapin, L.L. (1990). *Probability and Statistics for Modern Engineering*, 2<sup>nd</sup> Edition, PWS-Kent Publishing Company, Massachusetts, USA.

Hogg, R.V., McKean, J.W. and Craig, A.T. (2013). *Introduction to Mathematical Statistics*, 7th Edition, Pearson, Boston, USA.

Levin, R.I. and Rubin, D.S. (1998). *Statistics for Management*, 7<sup>th</sup> Edition, Prentice-Hall, New Jersey, USA.

Lucey, T. (2002). *Quantitative Techniques*, 6<sup>th</sup> Edition, Continuum, London, UK.

Mendenhall, W., Beaver, R.J. and Beaver, B.M. (2013). *Introduction to Probability and Statistics*, 14<sup>th</sup> Edition, Pacific Grove, California, USA.

Mendenhall, W., Reinmuth, J.E. and Beaver, R. (1993). *Statistics for Management and Economics*, 7th Edition, Duxbury Press, California, USA.

Scheaffer, R.L., Mulekar, M.S. and McClave, J.T. (2011). *Probability and Statistics for Engineers*, 5<sup>th</sup> Edition, Brooks/Cole, Boston, USA.

**Supplementary:**

Biow, L. and Wattenmaker, P.D. (1993). *How to Use Your Computer*. CA: Ziff-Davis Press.

CIOB, *Construction Computing*. CIOB.

December, J. (1996). *HTML 3.2 and CGI Unleashed: Professional Reference*. Sams Net.

Edding, J. (1994). *How the Internet Works*. C.A: Ziff-Davis Press.

Kirkpatrick, L.A. and Feeney, B.C. (2015). *A Simple Guide to IBM SPSS® Statistics for Version 22.0*, Cengage Learning, Boston, USA.

Stephen, M. (1997). *PowerPoint 97 for Windows Made Simple*. Made Simple, Oxford, UK.

Venditto, G. (1984). *Best Uses for Your Computer*. CA: Ziff-Davis Press.

West, B. (1994). *Basic Computing Principle*. Oxford: NCC Blackwell.