Subject Description Form

Subject Code	BRE366
Subject Title	Analytical Skills and Methods
Credit Value	2
Level	3
Pre-requisite / Co-requisite/ Exclusion	Pre-requisite: Level 2 core subjects Co-requisite / Exclusion: Nil
Objectives	To prepare students for undertaking a manageable piece of research leading to a dissertation.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Describe and appraise the key concepts, elements and requirements in research. b. Describe the meaning of plagiarism and demonstrate the proper ways to avoid it. c. Apply the knowledge of fundamental statistics in collecting, organizing, summarizing, presenting and analyzing data, as well as drawing valid conclusions. d. Conduct hypothesis testing and valid multiple regression analysis with its diagnostic tests. e. Produce a dissertation research proposal with researchable topic related to the fields of construction and real estate.
Subject Synopsis/ Indicative Syllabus	A. Concepts: Philosophy of sciences, theory, hypothesis, methodology, method, research objective, problem statement, classification of research, etc. B. Process: Literature search and review, referencing and plagiarism, work plan, authorship skills, data assembly, time management, writing up, etc. C. Qualitative research: Strategy, approaches, methods, analysis, examples, limitations, etc. D. Quantitative research methods: Descriptive and inferential statistics, normal distribution, basic quantitative statistical techniques, hypothesis testing and decision making, correlation and regression analysis, and application of computer softwares/programs to handle statistical problems and calculations, etc. *(Remarks: Students are expected to learn these statistical techniques in more details and many other relevant quantitative techniques by their own initiatives.)* E. Writing out a dissertation proposal.
Teaching/Learning Methodology	In the lectures, teachers will introduce the course materials, explain the key theories and concepts and showcase examples of the methodology, elements and possible loopholes in doing a piece of research. The essential concepts and principles of various key subject areas under the qualitative and quantitative research methods will be presented in the lectures, leading to the preparation of initial dissertation proposals for submission. Tutorials will be used for discussion, problem-solving, hands-on demonstration, consultation and library visits. Interactive multi-media self-accessed

learning materials will be provided via the department's computer network (e.g. LEARN@PolyU blackboard subject websites). Coursework will be designed to assess the students' ability to demonstrate their understanding of the course materials and their abilities to achieve the intended learning outcomes.

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	100%	√	√	√	√	√	
	Total	100 %						

The subject "Analytical Skills and Methods" is a major component leading to the learning and completion of Dissertation or Capstone Project. Students must complete and pass each of the four assessment components of the subject in order to obtain an overall pass of the subject. Forty percent (40%) of the total coursework mark will be devoted to a test on qualitative research methods, and the other 40% to a test on quantitative research methods. Qualitative and quantitative research methods are complementary and supplementary to each other. They are not complete in themselves. Students need to demonstrate their learning outcomes, at pass levels, on both of them to complete the subject. Ten percent (10%) will be evaluated according to the attendance of the required face-to-face library workshop and the rest of 10% as the mark of the subsequent related online test. Marks will be allocated on an individual basis.

In case of outbound overseas exchange students, they need to access and review the subject materials mounted up to the LEARN@PolyU blackboard subject website themselves before taking the two make-up tests (40% each) upon return to Hong Kong. They also need to access the online library workshop materials themselves for perusal (10%) before taking the subsequent online test (10%).

The subject will be assessed on a continuous basis and no examination is required. The approach to coursework assessment is guided by two principles. First, the need to assess the extent to which the students have achieved the learning outcomes with respect to grading criteria. Second, the assessment itself should contribute in some way towards reflection and learning of the importance of research methods in Dissertation or Capstone Project. The total coursework mark will be based on a portfolio comprising a series of in-class written tests, attendance to library workshop, online quizzes and discussion. These assessment tools attempt to test the level of students' knowledge and application of fundamental qualitative research concepts and statistical techniques, in manipulating data for presentation, analysis and decision-making.

Student Study Effort Required	Class contact:	
	▪ Lectures	10 Hrs.
	▪ Tutorials	5 Hrs.
	Other student study effort:	

	▪ Self learning and recommended reading	65 Hrs.
	Total student study effort	80 Hrs.

Reading List and References	**Reference List:** **Essential:** HKPolyU - Department of Building and Real Estate. *Dissertation Guide.* Continuously updated. **Recommended:** Bell, J. and Waters, S. (2014) *Doing Your Research Project: A Guide for First-time Researchers*, 6th Edition, Maidenhead: McGraw-Hill Education. Blaikie, N (2010) *Designing Social Research: The Logic of Anticipation*. 2nd Edition, Cambridge: Polity Press. Booth, W.C., Colomb, G.G. and Williams, J.M. (2003) *The Craft of Research*, 2nd ed. Chicago: The University of Chicago Press. Chau, K.W., Raftery, J. and Walker, A. (1998) The Baby and the Bathwater: Research Methods in Construction Management. *Construction Management and Economics*, Vol. 16, No. 1, pp.,99-104. Collis, J. and Hussey, R. (2013) *Business Research: A Practical Guide for Undergraduate and Postgraduate Students,* 2nd edition. Basingstoke: Palgrave Macmillian, England. Fellows, R. and Liu, A. (2015) *Research Methods for Construction*, 4th ed., John Wiley & Sons. Harris, R. and Cundell, I. (1995) Changing the Property Mindset by Making Research Relevant. *Journal of Property Research*, 12, pp.75-78. Holt, G. (1998) *A Guide to Successful Dissertation Study for Students of the Built Environment,* 2nd edition. The Built Environment Research Unit, University of Wolverhampton. Kennedy, P. (2003) *A Guide to Econometrics*, 5th Edition, Cambridge: MIT Press. Knight, A. and Ruddock, L. Ed. (2008) *Advanced Research Methods in the Built Environment.* Chichester: Wiley-Blackwell. Kumar, R. (2014) *Research Methodology: A Step-by-Step Guide for Beginners*. London: Sage Publications. Levin, R.I. and Rubin, D.S. (1998) *Statistics for Management*, 7th edition, New Jersey: Prentice-Hall. Lizieri, C. (1995) Comment: Relevant Research and Quality Research: the Researcher's Role in the Property Market. *Journal of Property Research*, 12, pp.163-

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Mason, J. (2018) *Qualitative Researching*. 3rd edition, London: Sage.

Naoum, S.G. (2013) *Dissertation Research and Writing for Construction Students*, 3rd edition, London: Routledge.

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References on Probability and Statistics:

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

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

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

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

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

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

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