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 completion of Dissertation or Capstone Project. Students must complete and pass each of the five assessment components of the subject in order to obtain an overall Grade of the subject. There are four assessment components.

1. A term paper for qualitative research methods (40%)
2. One quiz on quantitative research methods (40%)
3. One library workshop (attendance plus test) (10%)
4. Personal Reflection Journal on students' learning experience and learning-to-learn process development (10%)
5. Initial Dissertation Proposal (0%, Pass/Fail Assessment)

Students must discuss their initial dissertation topics with their academic advisors and get their academic advisors' signature approval for the Initial Dissertation Proposal for getting a "Pass" grade for the assessment component.

BRE students who participate in the exchange programme can register the subject outside Hong Kong. They need to fulfill all coursework assignments/components, by learning the subject materials from LEARN@PolyU. They need to attend the face-to-face quiz (Component 2) upon their returning to BRE, if no on-line option is provided.

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.163-166.

Lucey, T. (2002) *Quantitative Techniques*, 6th edition, London: Continuum.

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

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

Pindyck, R.S. and Rubinfeld, D.L. (1998) *Econometric Models and Economic Forecasts*, 4th Edition, Boston: McGraw-Hill International Editions.

Raftery, J., McGeorge, D. and Walters, M. (1997) Breaking Up Methodological Monopolies: A Multi-paradigm Approach to Construction Management Research. *Construction Management and Economics*, 15(3), pp. 291-297.

Render, B. and Stair, R.M. Jr (2006) *Quantitative Analysis for Management*, 12th Edition. Pearson Education, India.

Tan, W. (2018) *Research Methods: A Practical Guide for Students and Researchers*. World Scientific, Singapore.

References on Probability and Statistics:

1. Berenson, M.L., Levine, D.M. and Szabat, K.A. (2015). *Basic Business Statistics – Concepts and Applications*, 13th Edition, Pearson Education, Boston, USA.
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.
7. Lucey, T. (2002). *Quantitative Techniques*, 6th Edition, Continuum, London, UK.
8. Mendenhall, W., Beaver, R.J. and Beaver, B.M. (2013). *Introduction to Probability and Statistics*, 14th Edition, Pacific Grove, California, USA.
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.