



School of Information Management
INFO 513 QUANTITATIVE RESEARCH METHODS
Trimester 2, 2015
COURSE OUTLINE

Names and Contact Details

Course coordinator

Mary Tate

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Room: RH 504

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Lecturers

Mary Tate (School of Information Management)

Benoit Aubert (School of Information Management)

Jean-Gregoire Bernard (School of Information Management)

James Richard (School of Marketing and International Business)

Richard Arnold (School of Mathematics, Statistics and Operations Research)

Nokuthaba Sibanda (School of Mathematics, Statistics and Operations Research)

Trimester Dates

Teaching Period: Monday 13th July – Sunday 18th October

Withdrawal from Course

1. Your fees will be refunded if you withdraw from this course on or before Friday 24th July 2015.
2. The standard last date for withdrawal from this course is Friday 25th September. After this date, students forced to withdraw by circumstances beyond their control must apply for permission on an 'Application for Associate Dean's Permission to Withdraw Late' including supporting documentation. The application form is available from either of the Faculty's Student Customer Service Desks or [online](#)

Class Times and Room Numbers

Days: Wednesdays

Time: 4:00 – 7:00pm

Room: RH 421

Course Delivery

Weekly seminars/debates.

Expected Workload

To achieve satisfactory grades, you will need to spend at least 12.5 hours per week on INFO513, including time spent in class. Some aspects of the course will require less time, whereas others will require slightly more, depending on your previous knowledge of the topic. Before each session, please read the material for the week's topic and be ready to discuss the readings and other set work prepared for the class.

Expected Workload

To achieve satisfactory grades, you will need to spend at least 12.5 hours per week on INFO513, including time spent in class. Some aspects of the course will require less time, whereas others will require slightly more, depending on your previous knowledge of the topic. Before each session, please read the material for the week's topic and be ready to discuss the readings and other set work prepared for the class.

Prescription

An examination of quantitative research methods appropriate to advanced research.

Course Learning Objectives

Students who pass this course should be able to:	
1	Understand and apply the principles of theory operationalization using quantitative models in applied business disciplines
2	Understand and apply the principles of measurement and survey research in applied business disciplines
3	Understand and apply the principles and methods of quantitative analysis for hypothesis testing
4	Understand and interpret the results of statistical analysis using leading software packages

Assessment

Assessment items and workload per item	%	CLOs	Due Date
1 Participation	10	1 to 3	ongoing
2 Quantitative research project (survey design, data gathering, data analysis)	50	1 to 4	Week 12
3 Paper review and critique - 1 (max 1500 words)	20	1 to 4	Week 6
3 Paper review and critique - 2 (max 1500 words)	20	1 to 4	Week 11
Mandatory Course Requirements: Students must submit all pieces of assessment.			

The Assessment Handbook will apply to all VUW courses, see <http://www.victoria.ac.nz/documents/policy/staff-policy/assessment-handbook.pdf>.

If you cannot complete an assignment or sit a test or examination, refer to www.victoria.ac.nz/home/study/exams-and-assessments/aegrotat

Any student who is concerned that they have been, or might be, unable to meet any of the mandatory course requirements because of exceptional personal circumstances, should contact the course coordinator as soon as possible.

Link to general information

For general information about course-related matters, go to <http://www.victoria.ac.nz/vbs/studenthelp/general-course-information>

Note to Students

Your assessed work may also be used for quality assurance purposes, such as to assess the level of achievement of learning objectives as required for accreditation and academic audit. The findings may be used to inform changes aimed at improving the quality of VBS programmes. All material used for such processes will be treated as confidential, and the outcome will not affect your grade for the course.

Topic Outline and Reading List

1. Introduction to quantitative methods (Benoit Aubert)

- a. Objectives and assumptions of quantitative analysis and the scientific method
- b. Post-positivism and quantitative methods
- c. The role of quantitative methods in theory development and testing
- d. What is a model? What is the difference between a model and a theory?

Required Readings

- Colquitt, J., & Zapata-Pheelan, C. (2007). Trends in Theory Building and Theory testing: a Five-Decade Study of the Academy of Management Journal. *Academy of Management Journal*, 50(6), 1281-1303.
- Hair, J., Black, W., Babin, B., Anderson, R., & Tatham, R. (2006). *Multivariate data analysis (6th edition)*. New Jersey: Prentice Hall.(Chapter 1)
- Popper, K. (2000). Conjectures and Refutations. In T. Schick (Ed.), *Readings in the Philosophy of Science*, (pp. 9-13). Mountain View, CA: Mayfield Publishing Company.
- Wolfs, F. (nd). Appendix E: Introduction to the Scientific Method (pp. 1-6). Rochester: University of Rochester.

Recommended Readings

- Evermann, J., & Tate, M. (2011). Fitting Covariance Models for Theory Generation. *Journal of the Association of Information Systems*, 12(9), 632-661.

2. Exogeneity, independence, causality and prediction (Jean-Gregoire Bernard)

- a. The difference between causality and prediction
- b. Correlation is not causality
- c. Identifying unobserved confounding variables
- d. Making arguments for causality

Required Readings

- William R.. Shadish, Cook, T. D., & Campbell, D. T. (2002). Experiments and Generalized Causal Inference. Chapter 1 of *Experimental and quasi-experimental designs for generalized causal inference*. Wadsworth Cengage learning, pp.1-32.
- Aguinis, H., & Vandenberg, R. J. (2014). An ounce of prevention is worth a pound of cure: Improving research quality before data collection. *Annual Review of Organizational Psychology and Organizational Behavior*, 1(1), 569-595.
- Van de Ven, A.H. (2007). Designing variance studies. Chapter 6 of *Engaged Scholarship: A Guide for Organizational and Social Research*. Oxford, UK: Oxford University Press, pp. 161-193

3. Measurement -1 (Mary Tate)

- a. What is measurement?
- b. Introduction to latent variables (measuring 'existing objects' vs. measuring abstract constructs)
- c. Scale and index development, item generation
- d. Building a questionnaire – tips and techniques, including:
 - i. Structure of a questionnaire
 - ii. Question order
 - iii. Introductions
 - iv. Negatively worded questions
 - v. Double-barrel questions
- e. Using existing scales and adapting scales
- f. Face validity, card sorting and non-statistical validation techniques

Required Reading

- Boudreau, M.-C., Gefen, D., & Straub, D. (2001). Validation in Information Systems Research: A State-of-the-Art Assessment. *MIS Quarterly*, 25(1), 1-16.
- DeVellis, R. F. (2003). *Scale Development: Theory and Applications, 2nd edition*. Newbury Park, California: Sage Publications. Chapter 1, 2, 5
- Moore, G. C., & Benbasat, I. (1991). Development of an Instrument to Measure the Perceptions of Adopting an Information technology Innovation. *Information Systems Research*, 2(3), 192-222.
- Van Exel, N., & de Graaf, G. (2005). Q methodology: A sneak preview Retrieved from www.jobvanexel.nl website:

4. Measurement - 2 (Mary Tate)

- a. Theory and operationalisation
- b. Ontology of latent constructs and indexes
- c. Formative and reflective measures
- d. Higher order factors

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Required Reading

- Borsboom, D., Mellenbergh, G., & van Heerden, J. (2003). The theoretical status of latent variables. *Psychological review*, 110(2), 203-219.
- Edwards, J. R. (2001). Multidimensional Constructs in Organisational Behavior Research: An Integrative Analytical Framework. *Organisational Research Methods*, 4(2), 144-192.
- Jarvis, C. B., MacKenzie, S., & Podsakoff, P. M. (2003). A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research. *Journal of Consumer Research*, 30(2), 199-218.
- MacKenzie, S., Podsakoff, P., & Podsakoff, N. (2011). Construct Measurement and Validation Procedures in MIS and Behavioral Research: Integrating New and Existing Techniques. *MIS Quarterly*, 35(2), 293-334.

5. Surveys, Sampling and generalisability (Richard Arnold)

- a. The survey process
- b. Sources of survey error
- c. Objective setting
- d. Populations and frames
- e. Sample design
- f. Concepts of Weighting, Estimation, Bias, Variance

Required Reading

- Groves R.M., Fowler F.J., Couper M.P., Lepkowski J.M., Singer E., Tourangeau R. (2009) *Survey Methodology*, 2nd ed., Hoboken: Wiley (VUW library HA31.2 S963)
- Gideon Lior (ed.) *Handbook of Survey Methodology for the Social Sciences*. (2012) Springer. (selected chapters) (VUW library: eBook: H62.G384.2012)
- Seddon, P., & Scheepers, R. (2012). Towards the improved treatment of generalization of knowledge claims in IS research: drawing general conclusions from samples. *European Journal of Information Systems*, 21(1), 6-21.

6. Preparing and inspecting data – measurement model (Mary Tate)

- a. Preparing the data for analysis / data scrubbing
- b. Data characteristics / suitability of data for analysis
- c. Missing data
- d. Common method bias
- e. Dealing with non-normal data
- f. Inspecting the data

Required Reading

- Field, A. (2005). *Discovering Statistics Using SPSS* (2nd ed.). London: Sage. (chapter 5)
- Graham, J. (2009). Missing Data Analysis: Making It Work in the Real World. *Annual Review of Psychology*, 60, 549-576.
- Hair, J., Black, W., Babin, B., Anderson, R., & Tatham, R. (2006). *Multivariate data analysis (6th edition)*. New Jersey: Prentice Hall. (Chapter 2)
- Hinkin, T. (1998). A brief tutorial on the development of measures for use in survey questionnaires. Retrieved from <http://scholarship.sha.cornell.edu/articles/521>
- Podsakoff, P. M., Podsakoff, N. P., MacKenzie, S., & Lee, J.-Y. (2003). Common Methods Biases in Behavioural Research: A Critical Review of the Literature and Recommended Remedies. *Journal of Applied Psychology*, 88(5), 879-903.

7. Introduction to the theory of quantitative techniques (Nokuthaba Sibanda)

- a. Correlation
- b. Regression
- c. Analysis of variance
- d. Moderation and mediation
- e. Factor analysis

Required Reading

- Field, A. *Discovering Statistics Using SPSS* London: Sage. (2nd ed (2005): Chapters 4, 5, 8, 9, 15; or 3rd ed (2009) Chapters 6, 7, 10, 11, 17)) Note: Both editions of the book are in the library, so two options are given. Please check the edition of the copy you are using.
- Baron, R.M. and Kenny D. A. 1986. The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. *Journal of Personality and Social Psychology*, 51: 1173-1182.

8. Introduction to the theory of quantitative techniques – 2 (James Richard)

- a. Partial least squares (PLS)
- b. Co-variance based structural equation models (CB-SEMs)
- c. Selecting a method – comparing PLS and CB-SEM

Required Reading

- Field, A. (2005). *Discovering Statistics Using SPSS* (2nd ed.). London: Sage.
- Hair, J., Black, W., Babin, B., Anderson, R., & Tatham, R. (2006). *Multivariate data analysis (6th edition)*. New Jersey: Prentice Hall. (Chapters 9, 12, 13, 14, 15)

9. Analysing data and interpreting results – measurement model (James Richard)

- a. Interpreting measurement model metrics / measurement validity and reliability
- b. Use of EFA and CFA
- c. What happens if my measures are not valid?

Required Reading

- Conway, J., & Huffcut, A. (2003). A Review and Evaluation of Exploratory Factor Analysis Practices in Organisational Research. *Organisational research Methods*, 6(2), 147-168.
- DeVellis, R. F. (2003). *Scale Development: Theory and Applications*, 2nd edition. Newbury Park, California: Sage Publications. (Chapter 6)
- Hair, J., Black, W., Babin, B., Anderson, R., & Tatham, R. (2006). *Multivariate data analysis (6th edition)*. New Jersey: Prentice Hall. (Chapter 3)
- Straub, D., Boudreau, M.-C., & Gefen, D. (2004). Validation Guidelines for IS Positivist Research. *Communications of the ACM*, 13, article 24, 1-79.

10. Analysing data and interpreting results – the structural model – 1 (James Richard)

- a. Selecting appropriate model metrics
- b. Hypothesis testing: interpreting structural model metrics (PLS)
- c. Hypothesis testing: interpreting structural model metrics (CB-SEM)
- d. Interpreting error terms, VIFs

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Required Reading

- Bagozzi, R. P., & Yi, Y. (2012). Specification, evaluation, and interpretation of structural equation models. *Journal of the Academy of Marketing Science*, 40(1), 8-34.
- Chin, W. W., Peterson, R. A., & Brown, S. P. (2008). Structural equation modeling in marketing: Some practical reminders. *Journal of Marketing Theory and Practice*, 16(4), 287-298
- Curto, J. D., & Pinto, J. C. (2011). The corrected VIF (CVIF). *Journal of Applied Statistics*, 38(7), 1499-1507.
- Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of Marketing Research*, 18(3), 382-388.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1-55.

Recommended Reading

- Byrne, B. M. (2004). Testing for multigroup invariance using AMOS graphics: A road less traveled. *Structural Equation Modeling*, 11(2), 272-300. doi: 10.1207/s15328007sem1102_8

11. Analysing data and interpreting results – the structural model – 2 (James Richard)

- a. Analyzing moderation and mediation
- b. Second order factors
- c. Power and statistical significance
- d. What happens if my model is not a good fit?
- e. Comparing PLS and CB-SEM

Required Reading

- Chin, W. W., & Todd, P. A. (1995). On the use, usefulness, and ease of use of structural equation modeling in MIS research: A note of caution. *MIS Quarterly*, 19(2), 237-246.
- Chin, W. W. (1998). Issues and opinion on structural equation modeling. *MIS Quarterly*, 22(1), vii-xv.

- Chin, W. W. (2010). How to write up and report PLS analyses. In V. E. Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of partial least squares: Concepts, methods and applications* (pp. 655-690). Heidelberg, Germany: Springer.
- Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the Academy of Marketing Science*, 40(3), 414-433. doi: 10.1007/s11747-011-0261-6.
- Wolf, E. J., Harrington, K. M., Clark, S. L., & Miller, M. W. (2013). Sample size requirements for structural equation models: An evaluation of power, bias, and solution propriety. *Educational and Psychological Measurement*. doi: 10.1177/0013164413495237

12. Interpreting results, writing up, reviewing, critiquing and “parking lot” (Benoit Aubert)

- a. Writing up and presenting quantitative research
- b. Validity and reliability revisited – reviewing and critiquing
- c. Fit metrics revisited – reviewing and critiquing
- d. Generalisability and truth claims
- e. Comparing models
- f. Parking lot
 - i. Topics and questions carried over from previous weeks
 - ii. Quantitative research design help, question and answer
 - iii. Wrap up

Required Reading

- Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., & King, J. (2006). Reporting structural equation modeling and confirmatory factor analysis results: A review. *The Journal of Educational Research*, 99(6), 323-338. doi: 10.3200/JOER.99.6.323-338
- Martinez-Lopez, F. J., Gazquez-Abad, J. C., & Sousa, C. M. P. (2013). Structural equation modelling in marketing and business research. Critical issues and practical recommendations. *European Journal of Marketing*, 47(1-2), 115-152. doi: <http://dx.doi.org/10.1108/03090561311285484>.

Recommended Texts

Students are recommended to purchase these texts as they are very valuable resources for the future. If students do not purchase their own copy, they should borrow copies for at least the duration of the course.

- DeVellis, R. F. (2003). *Scale Development: Theory and Applications, 2nd edition*. Newbury Park, California: Sage Publications.
- Field, A. (2005). *Discovering Statistics Using SPSS* (2nd ed.). London: Sage.
- Hair, J., Black, W., Babin, B., Anderson, R., & Tatham, R. (2006). *Multivariate data analysis (6th edition)*. New Jersey: Prentice Hall.