Subject Description Form

<table>
<tr><td>Subject Code</td><td>APSS5210</td></tr>
<tr><td>Subject Title</td><td>Quantitative Methods for Policy Research and Evaluation</td></tr>
<tr><td>Credit Value</td><td>3</td></tr>
<tr><td>Level</td><td>5</td></tr>
<tr><td>Pre-requisite/
Co-requisite/
Exclusion</td><td>NIL</td></tr>
<tr><td>Assessment Methods</td><td>
<table>
<tr><td>100% Continuous Assessment</td><td>Individual Assessment</td><td>Group Assessment</td></tr>
<tr><td>1. Assignment(s)</td><td>15%</td><td>-</td></tr>
<tr><td>2. Class exercises</td><td>10%</td><td>-</td></tr>
<tr><td>3. Participation</td><td>20%</td><td>-</td></tr>
<tr><td>4. Presentation</td><td>-</td><td>20%</td></tr>
<tr><td>5. Final paper</td><td>-</td><td>35%</td></tr>
</table>
The followings apply to the overall grade:
• The grade is calculated according to the percentage assigned;
• The completion and submission of all component assignments are required for passing the subject; and
• Student must pass all component(s) if he/she is to pass the subject.
</td></tr>
<tr><td>Objectives</td><td>The purpose of this course is to help student gain a deeper understanding and appreciation of quantitative methods, expand their knowledge of quantitative analysis, apply knowledge to policy-relevant questions, and critically evaluate the claims of those who use quantitative research to promote specific policies.

Through handling empirical problems when working with real-world data, this course will cover a wide range of techniques useful to policy research and evaluation, including: tabular analysis, regression analysis in its various forms (multiple linear regression, multilevel methods, etc.), regression diagnostics and robust regression, matching techniques, and the use of instrumental variables, etc.</td></tr>
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Intended Learning Outcomes	Upon completion of the subject, students are able to: a. learn to distinguish good and poor quality quantitative empirical research; b. have a firm grasp of the types of research designs that can lead to convincing analysis; c. work and research with small and large-scale datasets; d. use statistical software to conduct quantitative analysis.
Subject Synopsis/ Indicative Syllabus	1 Overview of Quantitative Research Process for Policy Analysis • Quantitative research for evidence-based policymaking • Overview of research process • Exploring data and relationships 2 Sample Design and Survey Estimation • Simple random sample, multistage probability sample, stratified probability sample • Design effects, clustering effect 3 Cross-tabulations • Percentage table • Control variables, intervening variables, suppressor variables • Additive and interaction effects • Collapsing dimensions 4 Correlation and Regression (Ordinary Least Squares) • Correlation (and regression) coefficients • Effects of outliers and leverage points, truncation, aggregation 5 Multiple Correlation and Regression (OLS) • Test of significance of regression coefficients, p-value, degree of freedom, goodness-of-fit measure (e.g. BIC statistic), multicollinearity • Coefficient of determinant (R^2), root mean square error • Graphical representation • Dummy variables • Sub-group comparisons • Non-linear transformations: curvilinear, semilog, etc. 6 Regression diagnostics • Residual analysis • Robust regression • Bootstrapping and standard errors 7 Scale Construction • Issues of validity and reliability • Additive scaling, factor-based scaling, effect proportional scaling 8 Categorical Data Analysis • Log-linear Analysis • Binominal logistic regression • Multinominal logistic regression • Ordinal logistic regression • Tobit regression • Fixed effects and random effects modelling

	9 Other Issues • Issues on research design and interpretation • Multiple imputation of missing data *Note: All above contents in the Indicative Syllabus will be taught in a flexible way (i.e., not necessary to follow the same sequency), according to the learning capability and levels of comprehension of the students.*
Teaching/Learning Methodology	The course will use local and international case materials as illustration. Lectures in the hybrid mode will be delivered and supplemented by workshops. Students are required to give three presentations to demonstrate the puzzles and hypotheses, alternative explanations and operationalization, and empirical findings from their group projects. Stata workshops will be arranged to allow them to get familiarized with a range of commonly used statistical analysis methods.
Assessment Methods in Alignment with Intended Learning Outcomes	

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed			
		a	b	c	d
1. Assignment(s)	15 %	√	√	√	√
2. Class exercises	10%	√	√	√	√
3. Participation	20%	√	√	√	√
4. Presentation	20%	√	√	√	√
5. Final paper	35%	√	√	√	√

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Assignments
Students are expected to understand the continuous and categorical data analysis method and finish two assignments.

Class exercise
Students are expected to complete three analytical exercises involving completion of tasks associated with quantitative studies of policy-relevant phenomena. It will be a quick response to intended learning outcomes.

Participation
Students are expected to actively participate in course activities, e.g., asking and answering questions, giving peer feedback, etc. Delivered in a hybrid mode under the COVID-19, this course should embrace an interactive learning mode.

Presentations
Students are expected to give three presentations to demonstrate the puzzles and hypotheses, alternative explanations and operationalization, and empirical findings from their group projects. They can also provide their understanding

	towards crucial concepts and development of modern statistics and how they are important to policymaking. *Final paper* Students are required to submit a group paper about 12 pages elaborating the appraisal they give in the presentations, or the quantitative methods they develop for their research. The paper will have to cover their research questions, proposed research methods and justifications, empirical findings, and policy implications.	
Student Study Effort Required	Class contact:	
	▪ Lecture	26 Hrs.
	▪ Workshop	13 Hrs.
	Other student study effort:	
	▪ Presentation	20 Hrs.
	▪ Individual Assignment	20 Hrs.
	▪ Group work and self-study	33 Hrs.
	Total student study effort	112 Hrs.
Reading List and References	**<u>Essential</u>** Cameron, A. C., & Trivedi, P. K. (2010). *Microeconometrics using stata* (Vol. 2). College Station, TX: Stata press. Rabe-Hesketh, S., & Skrondal, A. (2008). *Multilevel and longitudinal modeling using Stata*. STATA press. Stigler, Stephen M. *The Seven Pillars of Statistical Wisdom*. Cambridge, Massachusetts: Harvard University Press, 2016. Salsburg, David. *The Lady Tasting Tea: How Statistics Revolutionized Science in the Twentieth Century.* Henry Holt & Co, 2002. Treiman, Donald J. *Quantitative data analysis: Doing social research to test ideas*. John Wiley & Sons, 2014. Long, J. Scott, and Jeremy Freese. *Regression models for categorical dependent variables using Stata*. Stata press, 2006. Long, J. Scott. *Regression models for categorical and limited dependent variables.* Thousand Oaks: Sage, 1997. Agresti, Alan. *An introduction to categorical data analysis*. Vol. 135. New York: Wiley, 1996.	

	Jeffrey M. Wooldridge. *Introductory Econometrics: A Modern Approach (5 edition) Mason.* OH: South-Western, 2012. Daniel A. Powers and Yu Xie. *Statistical Methods for Categorical Data Analysis*. San Diego, CA: Academic Press, 2008. **<u>Supplementary</u>** Hamilton, Lawrence C. *Statistics with STATA Version 12.* USA: Brooks/Cole, Cengage Learning, 2013. Rabe-Hesketh, S. Everitt, Brian Sophia Rabe-Hesketh, and Brian Everitt. *A handbook of statistical analyses using Stata*. 4th edition. Boca Raton, FL: Chapman & Hall/CRC. 2007. Clogg, Clifford C., and Edward S. Shihadeh. *Statistical models for ordinal variables*. Vol. 4. Sage Publications, Inc, 1994. Rudas, Tamás. *Odds ratios in the analysis of contingency tables*. No. 119. Sage, 1998. Breen, Richard. *Regression models: Censored, sample selected, or truncated data*. No. 111. Sage, 1996. Kateri, Maria. *Contingency Table Analysis*. Springer New York, 2014. Agresti, Alan, and Maria Kateri. *Categorical data analysis*. Springer Berlin Heidelberg, 2011.