

Cluster	Subject Title	Instructor	Credit	Semester
S-P	Regression Analysis and Beyond	Prof. Chen Chen	2	Winter 2025
Subject Description				
<p>Regression analysis and beyond is a statistic course designed for post-graduate students who major in education and psychology, helping them to deal with data analyses in research projects and/or dissertations. It consists of multiple regression and structural equation modeling in confirmatory factor analysis. Regression analyses are a set of statistical techniques that allow one to assess the relationship between DV(s) and a single IV or multiple IVs. Confirmatory factor analysis (CFA) as measurement model in structural equation modeling is a major method of establishing the internal validity of tests, questionnaires, and other measurements. The goal of this course is to give students a conceptual and practical understanding of the use of multiple regression and CFA in psychological sciences and educational settings.</p>				
Objective				
<p>By the end of the course students should be able to:</p> <ol style="list-style-type: none"> 1. understand the purpose of multiple regression regarding correlation and variance 2. know the situations in which various types of multiple regression are best applied 3. conduct effective statistical analyses predicting outcome variables from multiple predictors by using SPSS 4. know how to test construct validity of questionnaires and interpret the results 5. write clear and concise reports of the results of regression analyses and CFAs for presentations, dissertations, and peer-reviewed publications. 				
Learning Method				
<p>Lectures: to teach students basic concepts of multiple regression and CFAs Labs: to teach students the practical aspects of running regression analyses in SPSS and interpreting the results.</p>				
Content				
<p>Session 1: Simple (bivariate) regression and review of correlation Session 2: Multiple regression: Comparison to T Tests and ANOVA Session 3: Three types of multiple regressions Lab 1: Which MR strategy is selected? Session 4: Categorical independent variables Session 5: Mediation: Single mediator Session 6: Mediation: Two or more mediators Lab 2: Dummy variables and mediating effects Session 7: Multiple Regression: Summary, Assumptions, and Diagnostics</p>				

<p>Session 8: Confirmatory factor analysis Lab 3: Multiple regression diagnostics and factor analysis Session 9: Deal with missing data (Optional)</p>
<p>Requirement</p> <p>Students have to attend both the lectures and labs and submit lab assignments.</p>
<p>Evaluation</p> <p>Evaluation is composed of three parts: 30% attendance; 20% lab1; 20% lab2; and 30% lab3. Grades are assigned as follows: 95%-100% = A 90%-94.99% = A- 85%-89.99% = B+ 80%-84.99% = B <80% = F</p> <p>In general, grades would be in between B+ and A. <i>Note.</i> The principles of the AELC evaluation regulation are that each subject's maximum score is 100, and the passing score is 80; lower than 80 is marked as "F".</p>
<p>Textbook and reference (please indicate which are to be provided by instructor and which are to be obtained by students)</p> <p>Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). <i>Applied multiple regression/correlation analysis for the behavioral sciences (3rd ed.)</i>. Mahwah, NJ: Lawrence Erlbaum Associates. (Some chapters may be provided by instructor) MacKinnon, D. P., & Fairchild, A. J. (2009). Current directions in mediation analysis. <i>Current Directions in Psychological Science</i>, 18, 16-20. (Obtained by students) Melissa A. Hardy. (1993). <i>Regression with Dummy Variables</i>. (Ed). SAGE Publications. John Fox. (1991). <i>Regression Diagnostics: An Introduction</i>. (Ed). Ontario: SAGE Publications. Brown, T. A. (2015). <i>Confirmatory Factor Analysis for Applied Research</i>. New York, NY: Guilford. (Note. Other references may be recommended later)</p>
<p>Pre-course reading and preparation (if any)</p> <p>It would be better if students have certain basic knowledge on statistics for psychology and/or education.</p>