

COURSE CONTENT

Course Code / Title	: HP2100 Research Design and Data Analysis in Psychology
Pre-requisites	: HP1000 and HP1100 or CS2008 (PSMA)
No. of AUs.	: 3
Contact Hours	: 39

Course Aims

Building upon on the basic statistics concepts introduced in HP1100, this course will discuss analysis of experimental data from simple and factorial designs using analysis of variance (ANOVA). Elementary concepts of multiple regression and test of association in categorical data will also be introduced. The course is divided into lectures and tutorials. Lectures focus on conceptual issues and cover the content materials that need to understand in order to work with empirical data. Tutorials provide hands-on experience with data analysis using SPSS.

Intended Learning Outcomes (ILO)

By the end of the course, you should be able to:

1. describe different experimental design (between-subjects, within-subjects, factorial, Latin square, successive treatment, inter-mixed, split plot);
2. explain and conduct the variance decomposition principle underlying Analysis of Variance (ANOVA) for testing systematic (treatment) effect;
3. explain and conduct simple and multiple regression for describing and testing linear relationship between an outcome and explanatory variables.
4. explain and conduct how to test association between two categorical variables;
5. perform ANOVA, regression and test association between categorical variables analysis by hand calculation and through SPSS;
6. draw valid conclusions from the results of statistical analysis.

Course Content

This course is to teach students the statistical principles underlying ANOVA and regression methods for data analysis. First part of the course covers on how to perform Analysis of Variance (ANOVA) for one-way between-subjects, two-way between-subjects and one-way repeated measures design. Second part of the course covers model comparison approach for testing hypothesis in regression. The last part of the course provides an introduction to analysis of categorical data (test for association).

Course Assessment

CA1	Individual assignments	: 30%
CA2	Quizzes	: 40%
CA3	Group Project	: 30%
Total		100%

Reading and References

1. [GW] Gravetter, F. J., & Wallnau, L. B. (2017). Statistics for the Behavioral sciences (10th Edition). Belmont, CA: Thomson Wadsworth. (Ebook available through NTU library)
2. [MW] McBurney, D., & White, T.L. (2017). Research methods (9th ed.). Wadsworth Publishing
3. [Keith] Keith, T. Z. (2006). Multiple regression and beyond. Pearson/Allyn & Bacon

Planned Weekly Schedule (subject to changes, if any)

Week	Topic	Course LO	Readings/ Activities
1	Introduction to Analysis of Variance (ANOVA)	1,2	MW Ch 10
2	One-way ANOVA – Hypothesis testing	2,5,6	GW Ch 12
3	One-way ANOVA – Post-hoc comparisons	2,5,6	GW Ch 12
4	Basic concepts of factorial design and introduction to Two-way ANOVA	1,2	MW 11
5	Two-way ANOVA – Hypothesis testing	2,5,6	GW 14
6	Introduction to one-way repeated measures ANOVA	1,2	GW 13
7	Review of Simple Regression	2,5,6	GW 16, Keith Ch 2
8	Multiple Regression: Basics and statistical inferences	3,5,6	GW 16, Keith Ch 2
9	Multiple regression: categorical Predictors	3,5,6	Keith Ch 6
10	Multiple regression: Interaction effect between categorical and continuous Predictors	3,5,6	Keith Ch 6

11	Test of Association for categorical variables	4,5,6	GW 17
12	Revision 1	1,2,3,4,5,6	Nil
13	Revision 2	1,2,3,4,5,6	Nil