



PhD in Clinical Psychology
Cohort 6
August 2018 Semester

RES 851 Advanced Quantitative Research Methods 3 Credits
Prerequisite: Research Methodology (RES 850)

Meeting time: Wednesday: 5:30 – 8:30 p.m., DAC 507

Instructors: Dr. Paul M. Mbutu (pmbutu@daystar.ac.ke)
 Dr. George Kimathi (gkimathi@daystar.ac.ke)

Purpose

This course is intended to train students in the use of a range of inferential statistical techniques related to analysis of variance, correlation and regression. Further, the course is intended to train students to develop for a real world situation a representation (statistical model) that will provide an avenue for obtaining results when the model is employed to analyze data. Students will also be introduced to relevant research statistical software packages.

Expected Learning Outcomes

By the end of this course, students should be able to:

1. Analyze data using inferential statistical techniques that are relevant to psychology research;
2. Analyze the use of various ANOVA, correlation, and regression techniques in research studies;
3. Apply a range of modelling techniques to research design;
4. Critique a variety of statistical modelling techniques in psychology research;
5. Design a quantitative research project in psychology.

Content Areas

Descriptive statistics, measures of central tendency, measures of variability, bivariate correlation, confidence intervals, inferential statistics, power analysis, statistical vs. practical significance, hypothesis testing, significance testing, t-tests, one-way, two-way and three-way ANOVAs, single and multiple regression, chi-square tests, analysis of covariance, factorial designs, post hoc and planned comparisons, logistic regression. multivariate analysis of variance (MANOVA), multivariate analysis of covariance (MANCOVA), practical SPSS tests, repeated measures analysis of variance, discriminant analysis, ingredients of a statistical model, estimation of linear models, time series analysis, evaluation and selection of models, panel data models, structural equation modelling, stochastic models, linear differential models, curvilinear models, probit models, multiple levels models among others.

Teaching sessions (3 hrs each)

Week 1. Descriptive statistics, measures of central tendency, measures of variability- Dr Mbutu

Week 2. Bivariate correlation- **Dr Mbutu**

Week 3. Confidence intervals, inferential statistics, power analysis-**Dr Mbutu**

Week 4. Statistical vs. practical significance- **Dr Mbutu**

Week 5. Hypothesis testing, significance testing, t-tests, one-way- **Dr Mbutu**

Week 6. Two-way and three-way ANOVAs- **Dr Mbutu**

Week 7. Single and multiple regression- **Dr Mbutu**

Week 8. Chi-square tests, analysis of covariance, factorial designs, post hoc and planned comparisons, logistic regression- **Dr. Kimathi**

Week 9. Multivariate analysis of variance (MANOVA)- **Dr. Kimathi**

Week 10. Multivariate analysis of covariance (MANCOVA)- **Dr. Kimathi**

Week 11. Repeated measures analysis of variance- **Dr. Kimathi**

Week 12. Discriminant analysis, ingredients of a statistical model- **Dr. Kimathi**

Week 13. Estimation of linear models, time series analysis, evaluation and selection of models-
Dr. Kimathi

Week 14 & 15 Practical SPSS tests **Dr. Kimathi**

Teaching Methodology

Lectures, case studies, demonstration using various modelling software, exercises, discussions in class and groups, readings of published articles in refereed journals.

Instructional Materials/Equipment

Laptop computer, LCD projector, textbooks, sample articles, whiteboard, student handouts, statistical and modelling software packages.

Assessment

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| Assignments | 50 |
| Quantitative proposal | 50 |
| Total | 100 |

Core Textbooks

Kaplan, D. (2009). *Structural equation modelling: Foundations and extensions*. Thousand Oaks, CA: Sage.

Pedhazur, E. J. (2006). *Multiple regression in behavioural research* (4th ed.). Belmont, CA: Thompson-Wadsworth.

Reading

Dillard, F. H. (2000). *Econometrics*. Princeton, NJ: Princeton University Press.

Field, A. (2003). *How to design and report experiments*. Thousand Oaks, CA: Sage.

Field, A. (2009). *Discovering statistics using SPSS* (2nd ed.). Thousand Oaks, CA: Sage.

- Huberty, C. J., & Olejnik, S. (2006). *Applied MANOVA and discriminant analysis* (2nd ed.). Hoboken, NJ: Wiley Interscience.
- Huck, S.W. (2006). *Reading statistics and research* (4th ed.). New York: Longman.
- Nicol, A. A. M. (2010). *Displaying your findings: A practical guide for presenting figures, posters, and presentations*. London: American Psychological Association.
- Paul, A. R. (2000). *An introduction to classical econometric theory*. Oxford: Oxford University Press.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Allyn & Bacon.