M.Phil.

(EDUCATION)

SYLLABUS

PAPER – II (Elective 2) – RESEARCH DATA ANALYSIS USING COMPUTER SOFTWARE

Objectives

After the completion of this course student will be able to

1. access and prepare data.
2. define data.
3. label variables.
4. develop skill in data transformation.
5. identify and use the different steps for descriptive statistics.
6. use the computer software for the calculation of bi-variate statistics.
7. apply the computer software for the differential, relational and non parametric analysis and interpret the results.
8. enrich the knowledge base to identify and make prediction using the computer output.
9. develop the skill in use of appropriate statistical techniques
10. develop the skill of drawing charts and scatter plots using computer software.
11. instill confidence in using the statistical software.
12. acquaint strong statistical base.
13. analyse the differences in assumptions of different statistical techniques.
14. interpret the statistical results accurately and appropriately.

UNIT I: Data access, Data preparation and Transformations

1. Excel interface
2. Data editor
3. Data import
4. Define Variables Properties tool
5. Identify Duplicate cases tool
6. Copy Data Properties tool
7. Compute new variables using arithmetic, Cross–case, date and time, logical, Missing-value, random-number, and Statistical or string functions
8. Recode string or numeric values
9. Recode values into consecutive integers
10. Create conditional transformations
11. Using “Do if,” “Else if” “Else” and “End if” statements
12. Data Transformation functions

UNIT II: Descriptive statistics

1. Cross tabulations
2. Frequencies
3. Descriptive
4. Explore

UNIT III: Bivariate statistics

1. Means
2. t- tests (Two-Sample Tests)

UNIT IV: Correlation

1. Bivariate
2. Partial

UNIT V: Non-Parametric tests

1. Tests for one sample
2. Tests for two related samples
3. Tests for two independent samples
   (Chi-Square, Contingency, Kendall's Coefficient, Kendall's Tau, Sign Test, Runs Test, Sample K-S, Mann-Whitney U Test, Kruskal-Wallis One Way ANOVA, Friedman Two Way ANOVA, Wilcoxon Test, Rank Correlation).

UNIT VI: Prediction for numerical outcomes and identifying groups

1. Analysis of variance (ANOVA) – One Way, Two Way and Three Way
2. Linear regression
3. Logistic Regression
4. Principal components Analysis
5. Factor analysis
6. Cluster analysis – K-Means – Hierarchical
7. Discriminant Analysis
8. Reliability Analysis

UNIT VII: Reporting

1. Categorical charts
   - Bar – Line - Area – Pie - Box plot – Stem-Leaf
2. Scatter plots
   - Simple, grouped, scatter plot matrix - Fit lines - Dot charts
   - Histograms - Multiple use charts

Practicum

Each Unit has to be discussed/ taught with demonstration followed by student practical. At the end of the course a Report should be submitted by each student showing the evidence of practical done. The report has to be internally valued for the maximum of 25 marks. The theory examination (External) has to be valued for 75 marks.

Note

1. The Research Data Analysis may be taught by using the statistical packages available in the Department/ College. To mention a few SPSS, STATISTICA, OPENSTAT4, NCSS, STATPAC, MINITAB, VISTA etc.

2. Some of the free statistical packages can be downloaded from the website: www.freestatistics.tk or http://freestatistics.altervista.org/stat.php. The statistical package, OPENSTAT4 is one among them. This package is free for personal use. The operating manual and statistics book are also available free of cost. (Courtesy Prof. William G. Miller, Program originally developed by him, whose E-mail address is: openstat@msn.com).

3. All the statistical packages have their own manual and Built-in Statistical Modules/ Tutorial/ Book for quick reference.

References:

1. Antonius, Rachad. (2003). Interpreting Quantitative Data with SPSS. New Delhi: Sage Publications India Pvt. Ltd
2. Argyrous, George. (2005). Statistics for Research –with a Guide to SPSS. New Delhi: Sage Publications India Pvt. Ltd.
3. Boslaugh, Sarah E. (2004). An Intermediate Guide to SPSS Programming – Using Syntax for Data Management. New Delhi: Sage Publications India Pvt. Ltd
4. Einspruch, Eric L. (2003). Next Steps with SPSS. New Delhi: Sage Publications India Pvt. Ltd
5. Einspruch, Eric L. (2005). An Introductory Guide to SPSS for Windows. New Delhi: Sage Publications India Pvt. Ltd
6. Elliott, Alan C. and Woodward, Wayne A. (2006). Statistical Analysis Quick Reference Guide Book – With SPSS Examples. New Delhi: Sage Publications India Pvt. Ltd
7. Field, Andy. (2005). Discovering Statistics Using SPSS. New Delhi: Sage Publications India Pvt. Ltd.
8. Fielding, Jane L. and Gilbert G N , (2006). Understanding Social Statistics. New Delhi: Sage Publications India Pvt. Ltd
9. Foster, Jeremy J. Barkus, Emma and Yavorsky, Christian. (2006). Understanding and Using Advanced Statistics – A Practical Guide for Students. New Delhi: Sage Publications India Pvt. Ltd.
10. Foster, Jeremy J. (2001). Data Analysis Using SPSS for Windows Versions 8- 10- A Beginner's Guide. New Delhi: Sage Publications India Pvt. Ltd
11. Gaur, Ajai and Gaur, Sanjaya.S. (2006). Statistical Methods for Practice and Research –A Guide To Data Analysis Using SPSS. New Delhi: Sage Publications India Pvt. Ltd.
12. Miller, William, G. (2006). Statistics and Measurement Using the Free OpenStat Package.
13. Muijs, Daniel. (2004). Doing Quantitative Research in Education – with SPSS. New Delhi: Sage Publications India Pvt. Ltd
14. Puri, B.K. (2002). SPSS in Practice – An Illustrated Guide. 2nd Edition. London: Arnold Publishers.
15. Sirkin, Mark R. (2005). Statistics for the Social Sciences. New Delhi: Sage Publications India Pvt. Ltd.
16. Wagner, William E. (2006). Using SPSS for Social Statistics and Research Methods