MED-203: TOOLS AND TECHNIQUES OF DATA ANALYSIS

Credits 4 **Hours: 64** **Marks 100***(70+30)*

COURSE OBJECTIVES

After undergoing this course the students will be able to:-

1. Develop various types of research tools for data collection.
2. Develop an understanding of principles of quantitative and qualitative research methods
3. Develop an understanding of principles of data analysis and interpretation
4. Develop the vision to carry out qualitative and quantitative research.
5. Apply important qualitative and quantitative statistical techniques for analyzing and interpreting research data.
6. Use computers to code and analyze data.

COURSE CONTENT

UNIT- I: Types of research tools: their development and uses. (12 Hours)

- Basics of Behavioral Measurement: Concept, scope and need,
- Characteristics of a good research tool: Reliability, Validity and Norms
- Questionnaires, Interviews and observation schedules as tools of research.
- Tests: Aptitude, Achievement and Projective and non-projective tests,
- Norm-referenced and criterion-referenced tests
- Scales: Rating scales, Attitude scales., Semantic Differential, Q Methodology
- Socio-metric techniques.

UNIT- II (7Hours)

- Nature of educational data: Quantitative and Qualitative.
- Organization and analysis of qualitative data.
- Approaches to Qualitative data Analysis
- Organization and presentation of quantitative data.

UNIT-III (8 Hours)

- Normal Probability Curve and its Applications
- Inferential statistics: Standard errors, confidence limits
- Hypothesis testing- type I and type II errors.
- Test of significance, two tailed and one tailed tests.
- Parametric and Non Parametric Test: Concept and Assumptions

UNIT-IV: Research Design (6 Hours)

Simple Random Design, Quasi-Experimental, Level X Treatment Design, Factorial design, Latin Square Design

UNIT-V: Univariate and Bivariate Analysis (7 Hours)

- The t-test.
- The F-test - ANOVA
- Chi Square Test.
- Mann–Whitney *U* test
- Median Test

- The Goodness of Fit.
- Kruskal-Wallis H Test

UNIT- VI: Multivariate Analysis (10 Hours)

- The ANCOVA
- Principal component analysis, Factor Analysis
- Correlational Analysis- Biserial, point biserial, tetrachoric and phi-coefficient, Product moment, partial and multiple correlations.
- Regression and prediction
- Discriminant analysis

UNIT -VII (4 Hours)

- Overview of computer software for data analysis
- Coding of data and Data entry in various computer software (Microsoft Excel, SPSS)

TRANSACTIONAL STRATEGIES: Lectures, Seminars, Projects, Power Point Presentation, Small Groups Interactions, Reading of Texts.

TESTS & ASSIGNMENTS: **(10 Hours)**

- Two tests of 10 marks each. Marks of best out of two will be taken
- Two Assignments of 10 Mark each. Suggested List:
  -Write a Review Paper for dissertation.
  -Development of an appropriate Research Tool

SUGGESTED READING:

1. Mouley, George J.*: The Science of Educational Research.*
2. Kerlinger, Fred N.: *Foundations of Behavioural Research.*
3. Keeves, John P. (Ed.): *Educational Research, Methodology and Measurement : An International Handbook.*
4. Best, John W. : *Research in Education*
5. Good, C.V.: *Introduction to Research*.
6. Dalen, Deobold B. Van: *An Introduction to Educational Research.*
7. Garrett, H.E.: *Statistics in Education and Psychology*.
8. Guilford, J.P.: *Fundamental Statistics in Psychology and Education.*
9. Verma, M.: *An Introduction to Educational and Psychological Research*.
10. Myros J.K.: *Fundamentals of Experimental designs.*
11. Fisher, R.: *Designs of Experiments*.
12. Asthana, H.S. & Bhushan, B.: *Statistics for Social Sciences. Prentice Hall of India (2007)*

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