

**DISCIPLINE SPECIFIC ELECTIVE COURSE –5C: STATISTICAL METHODS IN  
PSYCHOLOGY AND EDUCATION**

**CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE**

| Course title<br>& Code                                      | Credits | Credit distribution of the course |          |                        | Eligibility<br>criteria               | Pre-requisite of<br>the course<br>(if any)                           |
|-------------------------------------------------------------|---------|-----------------------------------|----------|------------------------|---------------------------------------|----------------------------------------------------------------------|
|                                                             |         | Lecture                           | Tutorial | Practical/<br>Practice |                                       |                                                                      |
| Statistical<br>Methods in<br>Psychology<br>and<br>Education | 4       | 3                                 | 0        | 1                      | Class XII<br>pass with<br>Mathematics | Knowledge of<br>basic statistics<br>and probability<br>distributions |

**Learning Objectives:**

The learning objectives include:

- To measure psychological traits and mental abilities
- To learn basic methods of test construction, item writing and item analysis
- To check the reliability and validity of test scores.

**Learning Outcomes:**

After successful completion of this course, students should be able to:

- Distinguish between Psychological measurement and physical measurement.
- Understand the meaning of Tests in Psychology and Education.
- Appreciate the uses and limitations of psychological tests.
- Learn the meaning and purpose of Item writing and analysis.
- Understand concepts of reliability and validity of test scores and their differences.
- Convert raw scores into different transformed scores.
- Apply Scaling rankings and ratings in terms of the Normal Probability Curve.

**SYLLABUS OF DSC-5c**

**Theory**

**Unit 1:**

**(15 Hours)**

**Importance of statistics in psychology and education.**

Importance of statistics in psychology and education. Levels of measurement: nominal ordinal interval and ratio scales. Distinction between psychological and physical measurements. General problems and sources of errors in measurements. Meaning and types of tests in psychology and education. History of psychological measurement and testing. Uses and limitations of tests. Varieties of tests. Characteristics of a good test. General steps of test construction. Test administration and scoring. Item writing and item analysis: Meaning and types of test items, Purpose and methods for evaluating test items.

**Unit 2:**

**(15 Hours)**

**Reliability and Validity:**

Reliability: definition Methods of determining reliability: Test-retest, Alternate or parallel forms, Split half technique, Rational equivalence. Effect upon reliability of lengthening or repeating or test. Reliability coefficient as a measure of true variance. Estimating true scores by way of regression equation and reliability coefficient. Index of reliability.

Validity: meaning; Estimation of validity; Types of validity: validity and test length; comparison between reliability and validity.

**Unit 3: (15 Hours)**

**Test Scores:**

Meaning and differences between norm referencing and criterion referencing.

Raw score transformations- percentile scores, standard score, normalised standard scores, T-scores and Stanine scores.

Intelligence: definition. Types of intelligence test scores. Psychological scaling methods- scaling of individual test items in terms of difficulty, scaling of rankings and ratings in terms of the normal probability curve.

**PRACTICAL LAB WORK (30 hours)**

**List of Practical:**

1. Computation of reliability by Rulon and Kuder Richardson formulas.
2. Computing reliability of a test whose length is increased/decreased.
3. Computing index of reliability standard error of measurement.
4. Computing validity oblique maximum validity then test length is increased.
5. Computing relative difficulty of questions difference in difficulty between different tests.
6. Problem based on Z scores.
7. Problem based on t scores.
8. Problem based on Stanine scales.
9. Problem based on percentile scores.
10. Computing numerical scores corresponding to grades or ratings.

**Practical work to be conducted using electronic spreadsheet / EXCEL/ Statistical Software Package/ SPSS/ calculators.**

**ESSENTIAL READINGS:**

- Anastasia, A. and Urbina, S. (2016) Psychological testing , Prentice Hall
- Garrett H.E.(2021), Statistics in Psychology and Education. Nation press.
- Gregory RJ(2016), Psychological testing: History, Principles and Applications. (updated 7<sup>th</sup> edition) Pearson
- Singh, A.K. (2019) Test, Measurements and Research in Behavioural Sciences Bharati bhavan
- Mangal S.K.(2016) Statistics in Psychology and Education. PHI learning Pvt Ltd.

**SUGGESTED READINGS:**

- Gupta S.C. and Kapoor V.K. (2019) Fundamentals of Applied statistics, Sultan Chand and sons.
- Goon A.M., Gupta M.K. and Dasgupta, B. (2016) Fundamental of Statistics, Volume 2, World Press Pvt Ltd.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch University of Delhi, from time to time.**