

# APPLICATION OF STATISTICS IN PHYSICAL EDUCATION (GENERAL 7) (3+0 Cr. Hr.)

## COURSE OBJECTIVES

- Elucidate the concept of variation and identify and pose statistical questions requiring investigation
- Plan a statistical data investigation including identifying variables and measures and proposing a method of data collection that will answer the question posed.
- Collect, manage and store statistical data ready for analysis.
- Apply fundamental statistical methods to explore, analyse and visualise data and test statistical hypotheses
- Interpret statistical analysis and draw conclusions in context and in the presence of uncertainty

## COURSE CONTENTS:

- i. Introduction of Statistics in Sports**
  - a. Definition and importance of Statistics in Sports
  - b. Data Different types of data and variables
- ii. Classification and Tabulation of data, Frequency distribution, stem-and-Leaf diagram, Graphical representation of data Histogram, frequency polygon, frequency curve.**
- iii. Measure of Central tendency, Definition and calculation of Arithmetic mean, Geometric mean, Harmonic mean, Median quantiles and Mode in grouped and un-grouped data.**
- iv. Measure of Dispersion, Definition and Calculation of Range, quartile deviation, Mean deviation, Standard deviation and variance, coefficient of variation.**
- v. Sampling and Estimation**
  - a. Sampling Probability and non-Probability Sampling, Simple random sampling stratified random sampling Systematic sampling error, Sampling distribution of mean and difference between two means.
  - b. Interference Theory: Estimation and testing of hypothesis, Type—I and type-II error, Testing of hypothesis about mean and difference between two means using Z-test and t-test, Paired t-test, Test of association of attributes using X<sup>2</sup> (chi-square) Testing hypothesis about variance.

## Recommended Books

1. Harris, M., Taylor, G., Harris, M., & Taylor, G. (2014). *Medical statistics made easy*. Banbury, England: Scion.

2. Chatfield, C. (2018). *Statistics for technology: a course in applied statistics*. Routledge.
3. Green, S. B., & Salkind, N. J. (2016). *Using SPSS for Windows and Macintosh, Books a la Carte*. Pearson.
4. Searle, S. R., & Khuri, A. I. (2017). *Matrix algebra useful for statistics*. John Wiley & Sons.
5. Severini, T. A. (2014). *Analytic methods in sports: Using mathematics and statistics to understand data from baseball, football, basketball, and other sports*. Chapman and Hall/CRC.
6. Kissell, R., & Poserina, J. (2017). *Optimal Sports Math, Statistics, and Fantasy*. Academic Press.