

**Course Title:**           **Application of Statistics in Physical Education**

**Code Number:**       HPE- 304

**Credit Hours:**       03 hrs

**Pre-Requisites course Requirement/Skills:**    Nil

### **Objectives of Course**

At the successful completion of this course students will be able:

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

### **Course Contents**

#### **Unit-I**

#### **Introduction of Statistics in Sports**

- 1.1 Definition and importance of Statistics in Sports
- 1.2 Data Different types of data and variables
  - 1.2.1 Classification and Tabulation of data, Frequency distribution, stem-and-Leaf diagram, Graphical representation of data Histogram, frequency polygon, frequency curve.
  - 1.2.2 Measure of Central tendency, Definition and calculation of Arithmetic mean, Geometric mean, Harmonic mean, Median quantiles and Mode in grouped and un-grouped data.
  - 1.2.3 Measure of Dispersion, Definition and Calculation of Range, quartile deviation, Mean deviation, Standard deviation and variance, coefficient of variation.

#### **Unit-II**

#### **Sampling and Estimation**

- 2.1 Sampling Probability and non-Probability Sampling, Simple random sampling stratified random sampling Systematic sampling error, Sampling distribution of mean and difference between two means.
- 2.2 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.

### Teaching Learning strategies

- a) Inquiry based learning
- b) Cooperative Learning
- c) Multimedia usage
- d) Concrete examples
- e) Think -Pair-Share

### Assessment and Examination

#	Elements	Weightage	Details
1	Theory Examination based Assessment	40%	It takes Place at the mid-point of the semester. It is mostly in the form of a test but owing to the nature of the course. The teacher may assess their students based on term paper, research proposal development, field work and report writing etc.
2	Formative Assessment	60%	It is continuous assessment. It includes classroom Participation, attendance, assignments and Presentations, homework, attitude, and behavior, hands on activities, short test, quizzes etc.

### 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.