



**Course Name: Fundamentals of Statistics**

**Program in which it is offered: Any CVV Undergraduate Programmes**

**Course Category: Elective Schedule of Offering: Even/Odd**

**Course Credit Structure: 3**

**Course Code: XXXX**

**Total Number of Hours: 45**

**Contact hours per week: 3**

**Lecture: 2 Tutorial: 0 Practical/Practicum: 1**

**Last Revision Year: NA**

**Instructor: Dr. Sreeja Gangadharan**

### **Course Introduction**

This course aims at providing basic understanding about statistics and its use in research. This will act as a basic foundation for understanding Quantitative research and to use available statistical packages later in their Programme.

### **Course Objectives**

1. To familiarize students the basic meaning of statistics and its importance in Psychological Research.
2. To develop the skills of the students in describing and presenting the data using various descriptive statistics.
3. To develop the skills of students on developing and testing inferences using inferential statistics.

### **Course Outcome**

After the completion of this course, students will be able to:

4. Understand the basic statistical notations.
5. Manually perform the descriptive statistics.
6. Use appropriate inferential statistics for the available data.
7. Understand the basic non-parametric tests as well.

## CO/PO Mapping

CO/PO Mapping	CO1	CO2	CO3
PO1 - To enhance the knowledge base of students in the subject of psychology and allied areas.	X		
PO2- To develop the scientific inquiry and critical thinking skills of students.	X	X	X
PO4- To develop the professional communication skills to present data and information in a better way that enable professional competencies.		X	X

## Pedagogy

The pedagogy includes interactive lectures by regular and expert visiting faculty; individual learning such as guided reading, term papers, case studies, problem solving exercises, experience sharing exercises, reflections, etc.; collaborative learning such as group discussions, field visits, field study reporting, case analysis, cross case comparisons, video reviews, etc.

## Module Sessions

### Module 1: Descriptive Statistics (Lecture: 11 hrs.; Practical: 4 hrs.)

- Why you need statistics: Types of data
- Describing variables: Tables and diagrams
- Describing variables numerically: Averages, variation and spread
- Shapes of distributions of scores
- Standard deviation and z-scores: The standard unit of measurement in statistics
- Relationships between two or more variables: Diagrams and tables
- Correlation coefficients: Pearson correlation and Spearman's rho
- Regression: Prediction with precision

### Module 2: Significance Testing (Lecture: 12 hrs; Practical: 6hrs.)

- Samples and populations: Generalising and inferring
- Statistical significance for the correlation coefficient: Introduction to statistical inference
- Standard error: The standard deviation of the means of samples

- The *t*-test: Comparing two samples of correlated/related/paired scores
- The *t*-test: Comparing two samples of unrelated/uncorrelated scores
- Chi-square: Differences between samples of frequency data
- Probability
- Reporting significance levels succinctly
- One-tailed versus two-tailed significance testing
- Ranking tests: Nonparametric statistics

### **Module 3: Introduction to Analysis of Variance (Lecture 8hrs.; Practical 4 hrs.)**

- The variance ratio test: The *F*-ratio to compare two variances
- Analysis of variance (ANOVA): Introduction to the one-way unrelated or uncorrelated ANOVA
- Analysis of variance for correlated scores or repeated measures
- Two-way analysis of variance for unrelated/uncorrelated scores

### **Text Books**

- Coolican, H. (2004). *Research methods and Statistics in Psychology*. London: Hoddes Arnold.
- Aron, A., & Aron, E.N. (1994). *Statistics for psychology*. New Jersey: Prentice Hall.
- Agarwal. A., L. (2006). *Basics of Statistics*. New Delhi: New Age Publications.

### **Reference Books**

- Garrett H.E (1926), *Statistics in psychology and Education* 6th Ed, Bombay, Vakils, Feffer and Simons pvt. Ltd
- Frederick J. Gravetter, Larry B. Wallnau (2000) *Statistics for the Behavioral science* 5th Ed, Singapore, Wadsworth publication.
- Howell D.C (1999), *Fundamental statistics for the behavioral science* 4th Ed, London Duxbury press – An international Thomson Publishing company.
- Edward W. Minium, Bruce M. King, Gordon Bear (1995) *Statistical Reasoning in Psychology and Education* 3rd Ed, New York. John Wiley & sons