18BP086 BIOSTATISITCS AND RESEARCH METHODOLOGY

Hours Per Week :

L	T	P	CP	CL
3	1	-	-	4

Total Hours :

L	T	P
45	1	-

WA/RA	SSH/HSH	CS	SA	S	BS

SCOPE:

To understand the applications of Biostatics in Pharmacy. This subject deals with descriptive statistics, Graphics, Correlation, Regression, logistic regression Probability theory, Sampling technique, Parametric tests, Non Parametric tests, ANOVA, Introduction to Design of Experiments, Phases of Clinical trials and Observational and Experimental studies, SPSS, R and MINITAB statistical software's, analyzing the statistical data using Excel**.**

COURSE OUTCOMES:

Upon completion of the course, the student will be able to achieve the following outcomes:

COs	Course Outcomes	POs	PSOs
1	Know the operaion of m.s.excel, spss, r and Minitab, doe (design of experiment)	1,3,4	1
2	Know the various statistical techniques to solve statistical problems	1,3	1
3	Appreciate statistical techniques in solving the problems	1,3	1

UNIT - I **10HOURS**

INTRODUCTION: Statistics, Biostatistics, Frequency distribution

MEASURES OF CENTRAL TENDENCY: Mean, Median, Mode- Pharmaceutical examples **Measures of DISPERSION**: Dispersion, Range, standard deviation, Pharmaceutical problems

CORRELATION: Definition, Karl Pearson's coefficient of correlation, multiple correlations - Pharmaceuticals examples

UNIT - II **10HOURS**

REGRESSION: Curve fitting by the method of least squares, fitting the lines y= a + box and x= a + by, multiple regressions, standard error of regression– Pharmaceutical Examples **PROBABILITY:** Definition of probability, Binomial distribution, Normal distribution, Poisson's distribution, and properties - problems Sample, Population, large sample, small sample, Null hypothesis, alternative hypothesis, sampling, essence of sampling, types of sampling, Error-I type, Error-II type, Standard error of mean (SEM) - Pharmaceutical examples.

PARAMETRIC TEST: t-test (Sample, Pooled or Unpaired and Paired), ANOVA, (One way and Two way), Least Significance difference.

UNIT - III **10HOURS**

NON PARAMETRIC TESTS: Wilcox on Rank Sum Test, Mann-Whitney U test, Kruskal -Wallis test, Friedman Test

INTRODUCTION TO RESEARCH: Need for research, Need for design of Experiments, Experiential Design Technique, plagiarism

GRAPHS: Histogram, Pie Chart, Cubic Graph, response surface plot, Counter Plot graph **Designing THE METHODOLOGY:** Sample size determination and Power of a study, Report writing and presentation of data, Protocol, Cohorts studies, Observational studies, Experimental studies, Designing clinical trial, various phases.

UNIT - IV **8HOURS**

BLOCKING AND CONFOUNDING SYSTEM FOR TWO-LEVEL FACTORIALS

REGRESSION MODELING: Hypothesis testing in Simple and Multiple regression models **Introduction TO PRACTICAL COMPONENTS OF INDUSTRIAL AND CLINICAL TRIALS PROBLEMS**: Statistical Analysis Using Excel, SPSS, MINITAB®, DESIGN OF EXPERIMENTS, R - Online Statistical Software's to Industrial and Clinical trial approach

UNIT - V **7HOURS**

DESIGN AND ANALYSIS OF EXPERIMENTS:

FACTORIAL DESIGN: Definition, 2^2, 2^3design. Advantage of factorial design **Response Surface METHODOLOGY**: Central composite design, Historical design, Optimization Techniques

RECOMMENDED BOOKS (LATEST EDITION):

1. Pharmaceutical statistics- Practical and clinical applications, Sanford Bolton, publisher Marcel Dekker Inc. New York.
2. Fundamental of Statistics – Himalaya Publishing House-S. C. Guptha.
3. Design and Analysis of Experiments –PHI Learning Private Limited, R. Panner selvam.
4. Design and Analysis of Experiments –Wiley Students Edition, Douglas and C. Montgomery.