INSTITUTE OF SCIENCE, NAGPUR.

(An Autonomous Institute of Government of Maharashtra)

Certificate Course

in

"Statistical Package R"

(TO BE IMPLEMENTED FROM 2021 - 2022)

Introduction:-

R is a comprehensive statistical and graphical programming language, which is fast gaining popularity among data analysts. It is free and runs on a variety of platforms, including Windows, Unix, and macOS. It provides an unparalleled platform for programming new statistical methods in an easy and straightforward manner.

Overview

Total duration	30 hours
Course type	Classroom + online
In take capacity	30 – 40 students
Eligibility criteria	Ug or equivalent examination securing a minimum of 50% marks in the aggregate in the subjects
Target group	Students / professionals from the field public health, biology, sociology, geography, ecology, statistics, education, commerce and business administration, economics, political science, psychology
Fee structure	As per rules

Learning objectives

1. Understanding of r system and installation and configuration of r-environment

2. Understanding r packages, their installation and management

3. Understanding

    a. R program structure

    b. R data type, command syntax and control structures

    c. File operations in r

4. Application of r programming

5. Preparing data in r

    a. Data cleaning

    b. Data imputation

    c. Data conversion

6. Visualizing data using r with different type of graphs and charts

7. Applying r features to solve problems in Statistical Inference, Correlation and Regression

Syllabus

1	**INTRODUCTION TO R**
1.1	Introduction
1.2	R as a statistical software and language
1.3	R as a calculator
1.4	R preliminaries
1.5	Methods of data input
1.6	Data accessing or indexing
1.7	Some useful built-in functions
1.8	Graphics with R
1.9	Getting help
1.10	Saving, storing and retrieving work
P1	**Practical**
2	**DESCRITPIVE STATISTICS**
2.1	Introduction
2.2	Diagrammatic representation of data
2.3	Graphical representation of data
2.4	Measures of central tendency
2.5	Measures of dispersion
2.6	Measures of skenewss and kurtosis
2.7	Selection of representative samples
P2	**Practical**
3	**PROBABILITY AND PROBABILITY DISTRIBUTIONS**
3.1	Introduction
3.2	Probability: Definition and properties
3.3	Probability distributions
3.4	Some special discrete distributions
3.5	Continuous probability distributions
P3	**Practical**
4	**STATISTICAL INFERENCE**
4.1	Introduction
4.2	Sampling distribution of sample mean
4.3	Estimation of parameters
4.4	Plots to check normality
4.5	Hypothesis testing
4.6	Goodness of fit tests
P4	**Practical**
5	**CORRELATION AND REGRESSION ANALYSIS**
5.1	Introduction
5.2	Correlation
5.3	Inference procedures for correlation coefficient
5.4	Linear Regression
5.5	Inference procedures for simple linear model
5.6	Validation of linear regression model
P5	**Practical**