III B.Tech – I Semester
(17CS501) STATISTICS WITH R PROGRAMMING

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	3	1	-	3

Pre-Requisites: None

Course Objectives:

- To enable the students to learn discrete and continuous random variables and fundamentals of R.
- To demonstrate probability distribution models and R functions for distribution models.
- To discuss sampling distribution, estimation and R functions for constructing confidence intervals.
- To illustrate hypothesis testing for means and variance and related R functions.
- To explain correlation and regression models and R functions for graphics.

UNIT- I:

Discrete probability distributions and Introduction to R Descriptive Statistics –Random variables – Discrete random variable –Expectation –Binomial, Poisson distributions.

Introduction to R software –Vectors –Matrices –Arrays –Lists –Data frames –Basic arithmetic operations in R –Importing and exporting files in R.

UNIT-II:

Continuous Probability distribution and Computing with R Continuous random variable –Normal distribution –Properties –Gamma distribution –Weibul distribution. R commands for computing probability distributions.

UNIT-III:

Sampling Theory and Test of Hypothesis Sampling –Central limit theorem (without proof) –Sampling distribution of means –point estimation –interval estimation. Construction of confidence intervals using R.

UNIT-IV:

Test of Significance: Introduction to test of Hypothesis –Type-I Error –Type-II Error –One tail and Two tail tests concerning single mean and two means–single proportion –two proportions. R programming for Z-test, t-test and F-test and Chi square test.

UNIT-V:

Analysis of Variance: ANOVA for one way classification –ANOVA for two-way classification. R programming –ANOVA for one way classification –ANOVA for two way classification.

UNIT-VI:

Correlation and regression: Simple correlation and regression –Regression by the method of least squares –Rank correlation–Multiple linear regression. R programming for correlation and regression.

Course Outcomes:

1	Identify discrete and continuous random variables and data structures in R.	L2
2	Apply discrete and continuous probability distributions to the given data and execute R- functions for probability distributions.	L3
3	Explain sampling distribution, estimation and R-functions for constructing confidence intervals.	L3
4	Write R program for standard statistical test.	L3
5	Apply ANOVA for the given data and execute R-commands for ANOVA.	L3
6	Apply the concepts of correlation and regression to the given statistical data using R-function and making use of R-graphic functions to visualize the data.	L3

Correlation of COs with POs & PSOs:

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	2	-	-	1	-	-	-	-	-	-	-	3	2	-
CO-2	3	2	-	-	1	-	-	-	-	-	-	-	3	2	-
CO-3	2	1	-	-	1	-	-	-	-	-	-	-	2	1	-
CO-4	3	2	1	-	1	-	-	-	-	-	-	-	3	2	1
CO-5	3	2	1	-	1	-	-	-	-	-	-	-	3	2	1
CO-6	3	2	1	-	1	-	-	-	-	-	-	-	3	2	1

Text Books:

1. Miller and John E. Freund, Probability and Statistics for Engineers, Prentice Hall of India.
2. G. Jay Kerns, Introduction To Probability And Statistics Using R, First Edition
(Free E-Book From R Software Website)

Reference Books:

1. Jay L. Devore, Probability And Statistics For Engineering And Sciences, Eighth Edition, Cengage Learning.
2. R Cookbook, Paul Teetor, Oreilly.
3. R In Action, Rob Kabacoff, Manning.
4. R For Everyone, Lander, Second Edition, Pearson.
5. The Art Of R Programming, Norman Matloff, No Starch Press.
6.Probability And Statistics: Dr.T.K.V.Iyengar, Dr.B. K. Krishna Gandhi, S.Ranganatham, Dr. M.V.S.S.N. Prasad, S.Chand Publications.

Web Links:

1. https://onlinecourses.nptel.ac.in/noc17_ma17/preview
2. https://onlinecourses.nptel.ac.in/noc16_ma03/preview
3. https://www.tutorialspoint.com/r/
4. http://www.stat.umn.edu/geyer/old/5101/rlook.html
5. http://www.r-tutor.com/elementary-statistics