CS/IT 251   **Probability &Statistics with R Lab**   **L P C**

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Course Objectives:
The student who successfully completes this course will have:
1. The knowledge to use R for statistical programming, computation, modelling and graphics.
2. The skill to write functions and use R in an efficient way.
3. The ability to fit some basic types of statistical models using R.
4. The idea to expand the knowledge of R on their own.

Course Outcomes

On completion of this course, students will be able to:

1. Write the programs in R to solve the statistical problems.
2. Apply various built in functions in R to solve the computational and modelling problems.
3. Interpret the statistical data by various functions of graphical representation.
4. Understand- reading, writing, working and manipulating the data in various data frames.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3										3
CO2	2	2										2
CO3	3	3										2
CO4	3	2										3

CO-PSO Mapping

	PSO1	POS2	PSO3
CO1	3	3	1
CO2	2	2	3
CO3	3	3	2
CO4	3	2	2

Lab – Course Content

Introduction to R
Functions
Control flow and Loops
Working with Vectors and Matrices
Reading in Data
Writing Data
Working with Data
Manipulating Data
Simulation
Linear model
Data Frame
Graphics in R

Pre – Requisites
CS/IT-151– C Programming.

Lab – Course Plan&Delivery:

LIST OF EXPERIMENTS	PERIODS
1. Graphical representation of data a) Bar plot b)Frequency polygon	3
2. Graphical representation of data a) Histogram b)Pie chart c) Scatter plot	3
3. Measures of central tendency a) Mean b)Median c)Mode	3
4. Measures of central tendency a)Geometric Mean e)Harmonic Mean	3
5. Measures of dispersion a)Range b)Quartile deviation	3
6. Measures of dispersion a)Mean deviation b)Standard deviation	3
7. Goodness of fit a) Binomial b)Poisson	3
8. Goodness of fit a)Normal b)Contingency table	3
9. Parametric tests a) t-test for one-mean b) t-test for two means	3
10.Parametric tests a) paired t-test b) F-test	3
11. Non-parametric tests a) Wilcoxon-Signed rank test (one sample) b) Wilcoxon-Signed rank test (Paired samples) c) Mann-Whitney test (Two samples)	3
12. Non-parametric tests a) Kolmogorov-Smirnov test (One sample) b) Kolmogorov-Smirnov test (Two samples)	3
13. Time series a) Trend line b)Non-linear trend line	3
14. Time series a)Moving averages b)ARIMA	3

Evaluation Methods:

Internal Lab Exam   :   40 Marks
Final Lab Exam   :   60 Marks

Topics Covered Beyond The Curriculum:
                Statistical concepts regarding testing of hypothesis

                Differences between C and R Programming

Semester End Observations for Future Guidance:
                Case studies to be explained are revised.

                Identified new problems to be assigned for the next academic year students.

Learning Resources:

   Text Books:

        1.Hands-on Programming with R, Garrett Grolemund, O'Reilly.

        2.R for Everyone: Advanced Analytics and Graphics, Jared P. Lander, Addison-Wesley