BUSINESS ANALYTICS LAB -I
[2-Credit Paper- Workshop Mode]

OBJECTIVES
- *To enable the students to know about the information needs of Management*
- *To introduce the concepts of data analysis methods*
- *To have hands-on training of Statistical Data Analysis through R*

METHODOLOGY
The methodology is predominantly by Problem Solving [using R], supplemented by lecture mode and case discussion. The students have to undertake a project work in a topic of their interest and product, whereby apply the concepts studied in the course as their course evaluation submission.

Unit-1

BASICS OF STATISTICS AND R
Basic Statistical Terms - Population and Sample (Theory), Understanding Data-Qualitative Vs Quantitative Data / Continuous vs Discrete (Theory) -Measurement Scales - Nominal, Ordinal, Interval & Ratio

Installation of software (R and R Studio) – Working with various data files – Data Cleaning – Data Manipulation

Descriptive Statistics – Summary statistics [Mean/Median/Mode/Quartiles, Percentiles / Standard Deviation / Coefficient of Variation/Measures of Skew ness & Kurtosis]

Importance of data visualization- types of charts - Bar/Pie Charts -Histogram -Box and Whisker Chart -Scatter Diagram – Introduction to ggplot

Unit-2

BASIC PROBABILITY CONCEPTS AND PROBABILITY DISTRIBUTIONS
Basic Probability Concepts – Types - Rules - Concept of Bayes' theorem

Probability Distribution - Types (Discrete, continuous) -Random variable -Use of expected value in Decisions making - Binomial Distribution - Poison Distribution - Normal Distribution

Theory of Sampling-Types probability sampling, non-probability sampling - Introduction to Sampling Distribution (Concept of SE) - Sample Size Estimation

Theory of Estimation- Types - Interval Estimates and Confidence Interval - Calculation Interval Estimates (C.I) for small & large samples

HYPOTHESIS TESTING
Tests for Mean and Proportions –One Sample test)
[One Sample z Test - One Sample t Test- One Sample p Test]

Testing of Hypothesis (two sample test) - Test for differences between means (large, small samples) - Test for proportions (small, large samples)

Unit-3

Parametric Tests – Introduction to Univariate Analysis – one sample mean tests/one sample proportion tests/t-tests
Bivariate Analysis – two sample mean tests/two sample proportion tests / t-tests
Chi Square Analysis - Test of Independence - Test of Goodness of fit
Analysis of Variance - One-Way Classification - Two way Classification
Theory of Correlation - scattered diagram, Karl-Pearson & Spearman Rank Correlation - Introduction to partial Correlation - Regression Analysis- Introduction to Time series and forecasting
Introduction to non-parametric tests – univariate and bivariate analysis

TEXT BOOKS:
1. Panneerselvam, R., RESEARCH METHODOLOGY, PHI Learning Pvt. Ltd., New Delhi, 2004
2. Levin R., and Rubin D, Statistics for Managers, Prentice Hall of India, New Delhi, 2006 (7th Edition)

REFERENCES
1. Panneerselvam, R. (2012). Design and Analysis of Experiments, PHI, New Delhi
2. Wayne, Winston (2014). Microsoft Excel 2013: Data Analysis and Business Modelling, Micro soft Press, Washington
3. Christian Albright and Wayne L. Winston (2011). Business Analytics: Data Analysis and Decision Making, Cengage Learning, New Delhi [5th Edition]

MAGAZINES & OTHER REFERENCES
1. www.emeraldinsight.com (A renowned research journal database)
2. *www.ficci.com (Official web site of Federation of Indian chambers, Commerce and Industry)*
3. www.ibef.org*(Official web site of India Brand Equity foundation, a subsidy of CII)*
4. *www.ncaer.org (National Council of Applied Economic Research – Govt. of India data resource)*

WEB RESOURCES:
1. www.stattutorials.com *(**Statistics tutorials** including worked examples using softwares like SPSS)*
2. www.analyzemath.com/statistics.html (**Statistics tutorials)**
3. www.burns-stat.com/pages/tutorials.html (**Statistics tutorials)**
4. www.search.ebscohost.com

Mode of Evaluation:
Continuous Internal Assessments– based on lab exercises