

# **Research Methodology**

## **Department of Computer Science**

### **UNIT – I**

#### **Introduction to Research Methods**

Motivation and Objectives of Research, Types and Approaches, Methods of Research: Theoretical and Experimental Research Process, Significance of Research - Methods Vs Methodology - Research Process – Components of Research Problem, Various Steps in Scientific Research, Literature Survey – Primary Data and Secondary Data. Major Internet Services, Working of Internet, Downloading Super Tools for Better Computing Internet, Searching the Keywords.

### **UNIT - II**

#### **Data Collection and Sampling Design**

Sources of Data: Primary Data, Secondary Data; Procedure Questionnaire- Survey and Experiments - Sampling Merits and Demerits, Sampling Errors, Processing and Analysis of Data - Statistics in Research -Measures of Central Tendency -Measures of Dispersion - Measures of Asymmetry (Skewness) – Error Analysis – Formulation of Hypothesis.

### **UNIT - III**

#### **Statistical Modeling and Time Series Analysis**

Fundamentals of Statistical Analysis and Inference, Probability Distributions, Binomial, Poisson and Normal Distributions, Concepts of Correlation and Regression, Fundamentals of Time Series Analysis, Testing of Hypothesis: t – Test (Difference of Means and Paired t Test); F Test; Goodness of Fit ( $\chi^2$  Test). Interpretation, Mathematical and Statistical analysis using software tools like MAT lab and SPSS or other tools.

### **UNIT – IV**

#### **Report Writing**

Structure and Components of Research Report, Types of Report - Techniques of Interpretation, Precautions in Interpretation, Significance of Report Writing, Different Steps in Report Writing, Layout of Research Report, Mechanics of Writing Research Report. Research Publications - Impact Factor, Science Citation Index, Scopus Citation Database, IPR

## **Books for References**

1. C.R. Kothari, Research Methodology Methods and Techniques, 2/e, Vishwa Prakashan, 2006.
2. Bendat and Piersol, Random Data: Analysis and Measurement Procedures, Wiley Interscience, 2001.
3. Shumway and Stoffer, Time Series Analysis and Its Applications, Springer, 2000.
4. Jenkins, G.M., and Watts, D.G., Spectral Analysis and Its Applications, Holden Day, 1986.
5. S.C.Gupta and V. K. Kapoor, Fundamentals of Mathematical Statistics, 11<sup>th</sup> Edition-2002 .
6. Donald H. McBurney, Research Methods, 5<sup>th</sup> Edition, Thomson Learning, ISBN: 81-315-0047-0, 2006.
7. Helmet Kopka and Patrick.W.Daly, “A Guide to Latex and Electronic”, 4<sup>th</sup> Edition – Addison- Wesley Longman Limited, 2004 (Section 3.1-3.4, 4.1,4.2,4.5,4.8, 5.1, 5.3 and 9.3).
8. Section Amos Gilat, MATLAB, An Introduction with Applications, John Wiley & Sons, 2004. (Chapters 8 and 9).
9. Leslie Lamport, LaTeX: A Document Preparation System, Addison Wesley, ISBN-13: 978-0201529838, 1994.