

(Common Pre-Ph.D paper for all Ph.d/M.Phil Students admitted from 2011-12 onwards)

(11PH00001)Research Methodology

Unit-I:Meaning, Objective and Motivation in Research: Types of Research, Research Approaches, Research Process, Validity and Reliability in Research

Unit-II:Research Design: Features of Good Design, Types of Research Design, Basic Principles of Experimental Design

Unit-III:Sampling Design: Steps in Sampling Design, Characteristics of a Good Sample Design, Random Samples and Random Sampling Design

Unit-IV:Measurement and Scaling Techniques: Errors in Measurement, Tests of Sound Measurement, Scaling and Scale Construction Techniques, Forecasting Techniques, Time Series Analysis, Interpolation and Extrapolation.

Unit-V:Methods of Data Collection: Primary Data, Questionnaire and Interviews, Collection of Secondary Data, Cases and Schedules.

Professional Attitude and Goals, Concept of Excellence, Ethics in Science and Engineering, Some Famous Frauds in Science (Case Studies).

Unit-VI:Correlation and Regression Analysis, Method of Least Squares, Regression Vs. Correlation, Correlation Vs. Determination, Types of Correlation and Their Specific Applications.

Unit VII:Statistical Interference: Tests of Hypothesis, Parametric Vs. Non-Parametric Tests, Procedure for Testing Hypothesis, Use of Statistical Techniques for Testing Hypothesis, Sampling Distribution, Sampling Theory, Chi-Square Test, Analysis of Variance and Covariance, Multivariable Analysis.

Unit VIII:Interpretation of Data and Report Writing, Layout of a Research Paper, Techniques of Interpretation.

Making Scientific Presentation at Conferences and Popular Lectures to Semi Technical Audience, Participating in Public Debates on Scientific Issues.

Books:

1. Research Methodology: Methods And Techniques - C. R. Kothari, 2nd Edition, New Age International Publishers.
2. Research Methodology And Statistical Tools – P. Narayana Reddy And G.V.R.K. Acharyulu, 1st Edition, Excel Books, New Delhi, 2008.
3. Statistical Methods – S. P. Gupta, S. Chand & Sons, New Delhi, 2005.