

# **Paper-II: Research Methodology**

## **(Credits-04, Lectures-60)**

**Objective:** To identify and apply appropriate research methodology in order to plan, conduct and evaluate basic research. The Course will furthermore enable scholars to distinguish between the scientific method and common sense knowledge while laying the foundation for research skills at higher levels.

### **UNIT-1: INTRODUCTION TO RESEARCH (12L)**

- 1.1 Introduction to research – Meaning and definition of research; Objectives of research; Motivations of research; Types of research; Formulating a research problem – selecting the problem, techniques involved in defining a problem
- 1.2 Research process and steps involved in the process; Criteria of good research; problems encountered in research.
- 1.3 Methods of Research (Survey, Observation, Case study, Experimental, Historical and comparative methods).

### **UNIT-2: RESEARCH DESIGN & SAMPLING DESIGN (08L)**

- 2.1 Meaning of research design; Need for research design; Features of research design; Different research designs; Parametric & non parametric methods.
- 2.2 Sampling – Meaning of sample; Sampling techniques; Steps in sampling; Types of sampling, advantages and limitations of sampling

### **UNIT-3: DATA COLLECTION & PROCESSING (10L)**

- 3.1 Literature Review- Need; Procedure for collection of literature; Manual collection from library; Usage of library; Collection of literature from Scopus; ScienceDirect etc.; Compiling literature; Software utilization in literature collection.
- 3.2 Data Collection & Processing - Collection of data – primary data and secondary data; Data Processing – processing the data; editing; coding and classification; tabulation; Analysis and Interpretation of data.

### **UNIT-4: SCALING & HYPOTHESIS (10L)**

- 4.1 Scaling method – types of measured scale and problems of scaling
- 4.2 Correlation – types of correlation; Scatter diagram method; Karl Pearson's Coefficient of Correlation; Regression – simple linear regression; linear growth rate.
- 4.3 Hypothesis – Characteristics of a good hypothesis; Procedure of testing hypothesis – flow diagram; Large sample tests; Small sample tests; Applications of t test, F test, Chi square test.

### **UNIT-5: RESEARCH WRITING (10L)**

- 5.1 Report-Types of Reports; Planning of Report Writing; Research Report Format; Principles of Report Writing; Writing a Review of Paper; Book review
- 5.2 Documentation of Data and its analysis in Thesis; Pictures and Graphs
- 5.3 Citation styles; Bibliography; References; Footnotes.
- 5.4 Writing a Synopsis; Dissertation & Thesis.

- 5.5 Basic knowledge of organizing Conferences, Symposia, Workshop, Exhibition etc.
- 5.6 Plagiarism and how to avoid.

#### **UNIT-6: SCIENTIFIC COMMUNICATION (10L)**

- 6.1 Types of Scientific Communications
- 6.2 Importance of publishing research papers
- 6.3 Publishing Research paper:
  - (a) Preliminaries, Format, Choosing Journal
  - (b) Title, Running Title
  - (c) Authors: Single and Multi authorship
  - (d) Writing Abstract
  - (e) Introduction section
  - (f) Materials and Methods Section
  - (g) Result Section
  - (h) Figures: Design Principles, Legends, Table components, Graphs: Types, Style, Tables v/s Graph
  - (i) Discussion Section: Format, Grammar Style, Content.
  - (j) Acknowledgements
  - (k) References: Different Styles
  - (l) Selecting Keywords
  - (m) Communication with the Editor, Handling Referees' Comments, Galley Proofs
- 6.4 Writing Review Articles
- 6.5 Preparing and Delivering of Oral and Poster Presentations
- 6.6 Preparing documents for MoUs, Confidentiality Agreements.

#### **REFERENCES:**

1. Research Methodology: Methods and Techniques by C. R. Kothari, New Age International Publishers.
2. Methodology of Research in Social Sciences by O. R. Krishnaswamy and M. Rangnatham Himalaya publication House.
3. Research Methodology-A Step-by-Step Guide for Beginners by Ranjit Kumar (2nd.ed), Pearson Education.
4. Research Methodology: Concepts and Cases by Chawla and Sondhi, Vikas Publication.