

Ph. D
ECONOMICS
Course Title: Research Methodology
(Credit 4)

COURSE OBJECTIVES

1. To provide proficiency to students in the theory of and practice to research, which helps them to develop scientific thinking in the research, that helps them to develop problems, objectives, conduct review of literature and develop methodology.
2. To learn data collection methods with emphasis on secondary and survey research.
3. To provide in depth understanding of various database on global and Indian economy.
4. To learn multivariate analysis techniques and to do statistical inference.

Course Contents

Module 1: Introduction to Research Methodology

Scientific Thinking - The Research Problem - Objectives – Methodology - Need of Review of Literature - Objectives of Review of Literature - The Functions of Literature - How to Conduct the Review of Literature - Reporting the Review of Literature.

Module 2: Data Base on Indian Economy

Time series, cross section, panel data on Indian economy. Introduce databases on India pertaining to economic performance such as growth and development, financial indicators, infrastructure, institutions, regional and geographical information. Data sources - MOSPI, NSSO, ASI, RBI, CSO, EPWRF, IHDS, NFHS, WORLD BANK, etc.

Concepts and definitions of relevant indicators using these databases; Scope of the data (spatial, temporal and representativeness); Issues and limitations of these databases such as reliability, comparability across other databases for similar indicators and possibilities of merging different datasets.

Module 3: Sampling Techniques

Random Variables and Probability Distributions – Normal Distributions – Sampling Distributions – Standard Error – Normal, Students 't', Chi Square, F, Binomial, Poisson Distributions – Testing of Hypothesis.

Different types of samples: random, stratified, multistage, cluster, systematic, snowball. Methods of choosing optimum sample size.

Module 4: Basics Tools For Data Analysis

Statistical tools: Random variables and probability distributions: Discrete and continuous - Normal Distribution-Sampling Distributions, Standard Error-Chi-square, student t and F distributions. Testing of Hypothesis: Various definitions, Parametric tests: Tests concerning Means, Proportion and Variance and ANOVA. Non parametric tests: 2 tests- Sign test, Run test, Mann-Whitney U test, Kruskal Wallis Test.

Module 5: Multivariate Analysis and its applications

The Data matrix and the vector of means- The correlation matrix and Dispersion matrix. Linear combination of variables, Eigen values and Eigen vectors. Uses and interpretation of Principal component Analysis, Principal Components in Regression Analysis. Principal component Analysis: Bivariate and multivariate. Discriminant analysis- Bivariate and Multivariate. Factor analysis, Cluster analysis.

Reading List

Chatfield, C., & Collins, A. J. (2018). Introduction to multivariate analysis. Routledge.

Cooper, R. A. and A. J. Weeks . (1983). *Data Models and Statistical Analysis*. New Jersey : Barnes and Nobel Books.

Dooly, M., Moore, E., & Vallejo, C. (2017). Research ethics. In E. Moore & M. Dooly (Eds), Qualitative approaches to research on plurilingual education (pp. 351-362).

Howell, K. E. (2012). *An introduction to the philosophy of methodology*. Sage.

Hughes, G. D., Onwuegbuzie, A. J., Daniel, L. G., & Slate, J. R. (2010). APA Publication Manual changes: Impacts on research reporting in the social sciences. *Research in the Schools*, 17(1), VIII.

Kothari, C. R. (2004). *Research methodology: Methods and techniques*. New Age International.

Kumar, R. (2018). *Research methodology: A step-by-step guide for beginners*. Sage.

Lipson, C. (2011). Cite right: a quick guide to citation styles--MLA, APA, Chicago, the sciences, professions, and more. *University of Chicago Press*.

Sirkin, R. M. (2006). Statistics for the social sciences. *Sage*.

Stevens, J. P. (2012). Applied multivariate statistics for the social sciences. *Routledge*.

University of Minnesota. (2003). A Guide to Research Ethics. Centre For Bio Ethics. U.S.A.

<https://www.mospi.gov.in/>

<https://www.rbi.org.in/Scripts/Statistics.aspx>

<https://dbie.rbi.org.in/DBIE/dbie.rbi?site=home>

<https://epwrfits.in/>

<https://data.worldbank.org/>

COURSE OUTCOME

- CO1.** Students will acquire skills to identify economic/development problems that transform into a research question, and design the research an appropriate way to answer it, that helps in decision-making.
- CO2.** Develop skills to design a research project and collect data, analyze data and interpret the results.
- CO3.** Have a critical thinking on research issues, methodologies in Economics research.
- CO4.** Understand ethical issues involved in the research and comply with the ethical practices.
- CO5.** Develop skills to identify the main qualitative and quantitative strategies of research and apply these in their areas of study.