

Course - II

Research Tools, Statistics & Data Analysis

Course Title & Code	Credits	Credit Distribution			Teaching Hours	Internal Marks	Exam Marks	Total Marks
		Lecture	Tutorial	Practical/ Practice				
Course - II: Research Tools, Statistics & Data Analysis	4	3	1	0	60 Hours	25	75	100

Course Objectives

Upon completion, scholars will demonstrate proficiency in applying descriptive and inferential statistics, including parametric and non-parametric tests. They will master data analysis software like SPSS, R, and VOSviewer, alongside bibliometric laws and web-based research tools. Students will effectively interpret complex outputs for high-quality research reporting and management.

Unit-1: Descriptive & Inferential Statistics (15 Hours)

- ☞ Descriptive and Inferential statistics: Central tendency, dispersion, correlation, and regression analysis
- ☞ Parametric tests: t-test, ANOVA, ACNOVA, Factor Analysis
- ☞ Non-parametric tests: Chi-square, Mann-Whitney, Kruskal-Wallis
- ☞ Selection of appropriate statistical tests for LIS research problems

Unit-2: Data Analysis Software & Visualization Tools (20 Hours)

- ☞ Spreadsheets: Data entry, coding, tabulation and basic analysis
- ☞ Conceptual use of SPSS/STATA and R: Data entry, cleaning, transformation, generating statistical outputs

- ☞ Data visualization: Tables, charts, graphs, reporting standards
- ☞ Interpretation of statistical output for thesis and research papers

Unit-3: Bibliometrics and Citation Analysis (15 Hours)

- ☞ Bibliometric laws: Bradford, Lotka, Zipf
- ☞ Citation analysis tools: VOSviewer, Biblioshiny (Bibliometrix)

Unit-4 Web-Based Research Tools (10 Hours)

- ☞ Web-based research and statistical tools: Online analytics and easy-calculation tools
- ☞ Altmetrics.com, SurveyMonkey, Google Form
- ☞ Research data management tools and practices

Essential Readings

- ☞ ALEXANDER (L) and COLEMAN (T). Statistics for librarians. London, Facet Publishing. 2016.
- ☞ CENTRE FOR SCIENCE AND TECHNOLOGY STUDIES, LEIDEN UNIVERSITY. VOSviewer. <https://www.vosviewer.com/>
- ☞ CRONIN (B) and SUGIMOTO (CR), Ed. Beyond bibliometrics: harnessing multidimensional indicators of scholarly impact. Cambridge, MIT Press. 2014.
- ☞ DEPT OF ECONOMICS AND STATISTICS UNIVERSITY OF NAPLES FEDERICO. Bibliometrix: The complete science mapping platform. <https://www.bibliometrix.org/>
- ☞ FIELD (A). Discovering statistics using IBM SPSS statistics. 5th ed. London, Sage Publications. 2017.
- ☞ GUPTA (SC) and KAPOOR (VK). Fundamentals of mathematical statistics. 12th ed. New Delhi, Sultan Chand & Sons. 2020.
- ☞ VENABLES (WN) and SMITH (DM). An introduction to R. (Manual), 2026. <https://cran.rproject.org/doc/manuals/R-intro.pdf>

Suggested Readings

- ☞ ALTMETRICS. <https://www.altmetric.com/>
- ☞ CENTRE FOR SCIENCE AND TECHNOLOGY STUDIES, LEIDEN UNIVERSITY. VOSviewer. <https://www.vosviewer.com/>
- ☞ CONNAWAY (LS) and RADFORD (ML). Research methods in library and information science. 6th ed. Santa Barbara, Libraries Unlimited. 2016.

- ☞ REVELLE (A). Preparing the data: data analysis for the library and information professional. Chicago, ALA Editions. 2010.
- ☞ SIEGEL (A) and WAGNER (S). Practical business statistics. 8th ed. Cambridge, Academic Press. 2022.
- ☞ VENABLES (WN) and SMITH (DM). An introduction to R. Network Theory, 2008.