

Guidelines of Discipline Specific Elective VI/VII Semester

(NEP UGCF 2022)

Research Methodology (Effective from Academic Year 2024-25)

Unit	Topic	Chapters	References	No. of Hours
Research Fundamentals	Meaning and significance of research, requirements and characteristics of research, types of research – basic, applied, analytical, conceptual, empirical, experimental, non-experimental, prospective, retrospective, exploratory /descriptive, qualitative, quantitative, mixed method. Research process, induction and deduction in research, introduction to research tools.	Ch 1 (Pg 21-31) 3.4 1.6	[2] [1] [1]	8
Problem Identification	Choosing an appropriate problem area, identifying sources of research articles, literature review – stating and evaluating the research problem, techniques and methodologies, state of the art.	7.2-7.6, 9.4, 10.2, 10.3	[1]	5
Data Analytics	Exploring and organizing data sets, pre-processing data, interpreting the data. Choosing appropriate statistics. Descriptive statistics - measures of central tendency and variability, measures of association. Inferential statistics – estimating population parameters, testing hypotheses.	Ch 8	[2]	12
Presenting research outcomes	Essential elements of a research paper - explanation of the research problem, description of methods and data, data analysis and its interpretation, identification of possible weaknesses of the study, presenting and summarizing the research output, drawing conclusions, adding bibliography and bibliographic styles.	Ch 13 (uptoPg 360)	[2]	10

Publication	Process of submission - Where to publish, the peer review process- single blind and double blind. Scientometric analysis, plagiarism, plagiarism checker.	9.5, 9.6 11.6 24.1, 24.7	[1]	5
Research Ethics	Professional code of ethics in research, intellectual property rights - patents, copyright and related issues; fraud and misconduct in science.	Ch 23 (up to 23.4)	[1]	5

REFERENCES:

1. Thomas, C. G. (2021). *Research Methodology and Scientific Writing*, 2nd Ed. Springer.
2. Leedy, P. D., & Ormrod, J. E. (2016). *Practical Research: Planning and Design*, 11th Ed. Pearson.

ADDITIONAL REFERENCES:

1. Ghezzi, C. *Being a Researcher: An Informatics Perspective*. Springer
2. Locharoenrat, K. (2018). *Research Methodologies for Beginners*. PAN Stanford Publication.
3. <https://www.unesco.org/en/articles/what-you-need-know-about-unescos-new-ai-competency-frameworks-students-and-teachers?hub=32618>

Practicals

Capstone Project: Students must choose an area of interest for research, based on the curriculum (but not limited by it) covered in the program. They should identify a research problem to solve. During the semester the students must document the research journey in the form of a report, which will be evaluated at the end of the semester. The students are encouraged to write a research paper based on the report, under the guidance of the teacher. The practical class for research methodology course should be utilized to perform the following tasks in the research process.

1. Search the research papers related to the chosen problem using academic search engines like Google Scholar, Scopus search, Web of Science database, etc.
 - a. Evaluate the venue of the source of research paper - Journals using citation metrics like CiteScore, SCImago Journal Rank (SJR)), Source Normalized Impact per Paper (SNIP) etc., Conferences venues are evaluated using indexing information, Core Ranking etc.
 - b. Summarize the reviewed papers in a tabular format with columns: Paper Title, Author(s), Year, Key Findings, and Citation Count.
 - c. Explore reference management tools like Mendley / Zotero / EndNote to organize, store, and manage references.

2. Practice data analysis techniques taught in the class and identify a suitable technique required to solve the chosen research problem.

3. Write the research report and prepare to write the research paper.

a. Choose a document writing software and prepare the report as per the format given by the teacher.

b. Use the plagiarism check tool to assess the similarity index of the report and ensure that it is less than 10%

c. Explore the journal finder tools available for the publishers and select a suitable journal to submit the manuscript

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