

**GANPAT UNIVERSITY**  
**FACULTY OF SCIENCE**  
**Ph. D Course work**  
**Research Methodology**  
**(Compulsory for all research scholars)**  
**Credit: 04**

**Course Contents**

- 1 Foundations of Research:** Meaning, Objectives, Motivation, Research process and steps of it, Types of research.
- 2 Research Design:** Concept and Importance in Research, Problem Definition, Variables, Literature survey and review, Concepts of Qualitative and Quantitative Research, Descriptive Research Design, Experimental Research Design.
- 3 Scientific writing:** Developing an outline, Research Proposal, Report writing, Thesis writing, Research paper, Book review, Reference writing, Scientific abbreviations, Layout of a Research Paper, Journals in Computer Science, Impact factor of Journals, When and where to publish ? Ethical issues related to publishing, Plagiarism and Self-Plagiarism, Referencing and various formats for reference for writing books and research papers.
- 4 Presentation skills:** Process for preparing and creating presentation, Use of visual aids, Use of power point, Nonverbal communication, Vocal skills.
- 5 Data Analysis:** Data Preparation – Univariate analysis (frequency tables, bar charts, pie charts, percentages), Bivariate analysis – Cross tabulations and Chi-square test including testing hypothesis of association, Concept of measurement.
- 6 Tools and Techniques:** Methods to search required information effectively, Reference Management, Software for paper formatting like LaTeX/MS Office, Software for detection of Plagiarism, Area specific software.
- 7 Funding agencies:** Brief introduction of funding agencies (national and international), mandate of funding agencies and role of funding agencies for strengthening Research and Development facilities.

**Books Recommended:-**

1. 'Research Methodology- A Step-By-Step Guide for Beginners', **Ranjit Kumar**, (Pearson Education, Delhi) ISBN: 81-317-0496-3.
2. 'Research Methodology- Methods and Techniques', **Kothari, C.K.**, New Age International, New Delhi.
3. 'Research Methods', **Trochim, William M.K.**, Biztantra, Dreamtech Press, New Delhi, ISBN: 81-7722-372-0.
4. 'Design & Analysis of Experiments', **Montgomery, Douglas C.**, Wiley India.
5. "Applied Statistics & Probability for Engineers", **Montgomery, Douglas C., & Runger, George C.**, Wiley, India.
6. Business Research Methods – Donald Cooper & Pamela Schindler, TMGH, 9th edition