



**VINAYAKA MISSION'S  
RESEARCH FOUNDATION**  
(Deemed to be University under section 3 of the UGC Act 1956)

**Faculty of Physiotherapy**  
**Research Methodology – Syllabus**

**Total Hours : 60**

**Credits : 4**

The objective of this course is to develop critical core competencies and skills required to carry out research. These competencies and skills include: defining research questions; setting appropriate research objectives; study design that incorporates research objectives and budgetary constraints; secondary and primary data collection and instruments; sampling and analysis methods; and effective reporting of results; as well as the importance of ethical conduct in conducting research

At the end of the course, students will be able to...

- Develop the ability to apply the research methodology while working on a research study
- Describe the appropriate statistical methods required for a particular research design
- Choose the appropriate research design and develop an appropriate research hypothesis for a research study
- Develop an appropriate framework for research studies
- Understand the research writing clearly and to share the research findings effectively.

**Unit I: Research Methods**

1. Basics of Research - Meaning of Research, Objectives of Research, Motivation in Research, Types of Research, Significance of Research, Steps in Research Process.

2. Essentials of Good Research- Criteria of Good Research, Problems Faced by Researchers in India



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3. Research Problem - What is a Research Problem?, Selecting the Problem, Defining the Problem, Techniques for Defining the Problem
4. Research Design - What is Research Design?, Types of Research Design, Basic Principles of Experimental Designs
5. Report Writing - Significance of Report, Writing Steps in Writing a Report, Layout of a Research Report, Types of Reports, Oral Presentation, Mechanics of Writing, Precautions in Report Writing
6. Research Evaluation - Research Metrics, Indexing

## **Unit II: Applications Of Sampling And Methods Of Data Collection**

1. Sampling in quantitative, qualitative, and mixed research; Probability and non-probability sampling
2. Methods of data collection — identifying a tool using reliable and valid information; construction and use of tests, inventories, scales, checklist, and questionnaire; relevance and guidelines for conducting the interview, and observation focus group discussion, time sampling, field notes, the role of researcher in observation; collection of secondary (existing) data.

## **Unit III: Clinical Trials**

1. Introduction to Clinical Trials – Composition, Procedures, Records
2. Ethics and Regulations - Informed Consent, Responsibilities of Investigators & Sponsors, Adverse Event Reporting, Ethical Issues
3. Regulatory Guidelines - Clinical Trial Guidelines, Biosafety, Bioequivalence Studies

## **Unit IV: Biostatistics**



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Basics of Biostatistics - Principles and Practice in Biological Research, Data Collection and Presentation, Measures of Central Tendency: Mean, Median, Mode, Standard Deviation, Correlation Coefficient, Parametric and Non Parametric tests

### **Unit V: Data Interpretation and Scientific Communication**

1. Inferential Statistics - Drawing conclusions from statistical results, Interpreting confidence intervals and p-values, Errors in interpretation: Type I and Type II
2. Scientific Communication - Writing abstracts and executive summaries, Writing for journals, Preparing posters and visual summaries for Presentations, Communicating research to non-specialist audiences

### **REFERENCES**

1. Garg, B.L., Karadia, R., Agarwal, F. and Agarwal, U.K., 2002. An introduction to Research Methodology, RBSA Publishers.
2. Kothari, C.R., 1990. Research Methodology: Methods and Techniques. New Age International. 418p.
3. Arora, P.N. & Malhon, P.K. 1996. Biostatistics. Imalaya Publishing House, Mumbai.
4. Jogdand SN. 2004. Gene Biotechnology Published by Himalaya Publishing House, Mumbai.
5. Baxevanis, A.D. & Ouellette, B.F.F. 2001. Bioinformatics: A practical guide to the analysis of genes and proteins – Wiley Inter science – New York.
6. John G Webster. 2004. Bioinstrumentation .Student edition, John Wiley & sons, Ltd.
7. Kleinsmith, L. J. & Kish, V.M. 1995. Principles of Cell and Molecular Biology. 2nd edn., McLaughlin, S., Trost, K., Mac Elree, E. (eds.), Harper Collins Publishers, New York.



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8. Keith Wilson & John Walker. 2003. Practical Biochemistry Principles & techniques. 5th edition, Cambridge university press.
9. Palanivelu P. 2001. Analytical biochemistry and separation Techniques A Laboratory manual. 2nd edition, Published by Tulsi Book Centre, Madurai, Tamilnadu.
10. Ramadass, P. and A. Wilson Aruni 2009. Research and Writing - Across the Disciplines. MJP Publishers, Chennai