

PART - I**Introduction to Science and Research:**

Definition – History – Evolution of Scientific Inquiry – Verification versus falsification – Objectivity: Facts, theory and concepts – Philosophy of Science and Technology, Epistemology of sciences – Construction of scientific facts.

Introduction to Research Methodology

Meaning and importance of Research – Types of Research – Selection and formulation of Research Problem

Research Design – Need – Features – Inductive, Deductive and Development of models

Developing a Research Plan – Exploration, Description, Diagnosis, Experimentation, Determining Experimental and Sample Designs.

Analysis of Literature Review – Primary and Secondary Sources, Web sources –critical Literature Review

Hypothesis – Different Types – Significance – Development of Working Hypothesis

Research Methods: Scientific method vs Arbitrary Method, Logical Scientific Methods: Deductive, Inductive, Deductive-Inductive, pattern of Deductive – Inductive logical process – Different types of inductive logical methods.

Advanced Lessons in Research Methodology

Pre Clinical Research Methods: Analytical, In Silica, In Vitro, In Vivo: Scope and limitations in the context of Ayurveda.

Clinical Research Methods: Case Reports, Case Series, Observational Studies, Clinical Trials, Blinding, Randomization, Arms of a Trial, Positive Control, Negative Control, Placebo, Nocebo, Four Phases of Clinical Trials

PART - II**Research Methodologies adapted to the epistemology of Ayurveda**

Modern Methods of Research in Ayurveda: Reverse Pharmacology, Golden Triangle, Science Initiative in Ayurveda, WHO Guidelines for research on herbal medicine

New Methods for Research on Traditional Medicine: Limitations of RCTs, Linear, and Hierarchical Models versus Non-Linear and Circular Models, Whole Systems Research, and Network Pharmacology

Ethical Considerations

Environmental Impacts - Ethical Issues – Ethical Committees – Commercialization – copy right – royalty – Intellectual Property rights and patent law – Track Related aspects of intellectual property Rights – Reproduction of published material – Plagiarism – Citation and Acknowledgement – Reproducibility and accountability, Good Clinical Practice, Schedule Y, Schedule Z

Application of Computers, Databases and Search Engines in Research

Word Processing, Databases and Presentations – MS Word, MS Power point and MS Excel, Statistical Computation using SPSS, Use of Internet in Research – Websites, Search Engines, E-journal and E-Library – MEDLINE, Searching PubMed and other databases.

TEXT BOOKS/ REFERENCES:

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4. Trochim, W.M.K., 2005. Research Methods: the concise knowledge base, Atomic Dog Publishing. 270 p.
5. Day RA (1992) How to write and publish a scientific paper. Cambridge University press. London
6. Hempel,C. Philosophy of Natural science Englewood Cliffs, N.J: Prentice Hall, 1966.
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11. Kozak A, Kozak R.A., Staudhammer C.L., and Watts S.B. (2008). Introductory probability and Statistics; Applications for forestry and Natural sciences.CAB International, UK.408p.
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16. Chandra A. and Sexena T.P.(2000) Style Manual, New Delhi, Metropolitan Book Comp. Ltd.
17. SPSS – Operating Manual and handbook – Latest version
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