

Gujarat Technological University

Syllabus of Pre Ph.D. course work

Semester –I

Subject Name: RESEARCH METHODOLOGY

The objective of the course is to introduce the basic methods of conducting research, explore ideas in formulating research objectives and hypotheses and sample framework for taking up research studies in a structured manner. Also it is intended to facilitate for the development of an insight into different statistical tools for data analysis, interpretation and presentation of reports in different areas of research.

Research Methodology as a subject should help researchers to prepare the literature in chronological pattern and should logically analyze the concerns. This subject should help in framing the research problems to enhance the scale of understanding. In this world of global village, research papers are available in abundance; one thesis submitted by a scholar, in no way should be a repetition of a work already done. This subject should help researchers to use tools, techniques, concepts and world's best practices to present a unique research.

Unit-I: General introduction to Research: (04 Hrs)

History of Science & Technology: Importance of research, role of research, aims& objectives, research process, phases of research.

Unit-II: Research problem Formulation: (12Hrs)

Review of Research Literature: Purpose and use of literature review, locating relevant information, use of library & electronic databases, preparation & presentation of literature review, research article reviews, theoretical models and frame work. Identification of gaps in research, formulation of research problem, definition of research objectives.

Unit-III: Research Design: (12 Hrs)

Qualitative Methods: Types of hypothesis and characterization. *Quantitative Methods:* Statistical methods for testing and evaluation. *Characterization of experiments:* Accuracy, reliability, reproducibility, sensitivity, Documentation of ongoing research.

Unit-IV: Research Publication & Presentation: (12 Hrs)

Thesis, Research paper, Review Article & Technical Reports: Organization of thesis and reports, formatting issues, citation methods, references, effective oral presentation of research. *Quality indices of research publication:* impact factor, immediacy factor, H- index and other citation indices.

Unit-V: Research Ethics and Morals: (8 Hrs)

Issues related to plagiarism, collaborative models and ethics, acknowledgements. Intellectual Property Rights: copy rights, copy left: patents, Industrial designs, Trademarks.

Guidelines for Tutorials:

- It includes minimum two assignments related to papers of their research domain.
- Assignments should have critical review of papers referred.
- Presentation of assignment is mandatory.

Text Books:

1. Research Methodology, Methods & Techniques, C.R. Kothari, Viswa Prakashan, 2nd Edition, 2009.
2. Research Methods- A Process of Inquiry, Graziano, A.M., Raulin, M.L, Pearson Publications, 7th Edition, 2009.
3. How to Write a Thesis:, Murray, R. Tata McGraw Hill, 2nd Edition, 2010.
4. Writing For Academic Journals, Murray, R., McGraw Hill International, 2009.
5. Writing for Publication, Henson, K.T., Allyn & Bacon, 2005.

Reference Books:

1. What is this thing called Science, Chalmers, A.F., Queensland University Press, 1999.
2. Methods & Techniques of Social Research, Bhandarkar & Wilkinson, Himalaya publications, 2009.
3. Doing your Research project, Bell J., Open University Press, Berkshire, 4th Edition, 2005
4. A Handbook of Academic Writing, Murray, R. and Moore, S., Tata McGraw Hill International, 2006.