

Solapur University, Solapur

Ph.D. Course Work Syllabus

Common Paper for Faculty of Science

(w.e.f. June 2014)

Paper No.I: Research Methodology and ICT

1. Scientific Method:

Block schematic of scientific approach, inductive and deductive logic schemes, imperial basis of laws, theory, hypothesis, deductive system, requirements of theory, dynamics of theory construction, rational explanation, scientific explanation, limits of scientific explanation.

2. Formulation of Research Problem:

Criteria of good research, types of research, significance, literature review, purpose, process of literature review, analysis of an article, search engine, formulation of research problems, accuracy of definition, objectives of research, research design, preparation of research article and thesis.

3. Process of Research:

Definations of problem, planning of experiments, data collection and record keeping, results and discussions, presentation of research outcome as a research paper or filing patent.

4. Research Publications and Quality:

Indices, publications, types, Impact factor, calculation of Impact Factor, uses, calculation of immediacy Index, calculation, SCOPUS, h – index, advantages, criticism ISSN, ISBN.

5. ICT:

Various search engines available on internet, normal vs advanced search, key – words, formulation of search statement, Listing various journals in relevant topic, Science abstracts, e – database.

Application of Computers in research, internet browsing, tool bar options, provisions of MS – word, MS – Excel, MS – PowerPoint, Origin.

6. Fundamentals of Data Analysis and Statistical Methods:

Types of data and various methods of data collection, Framing of questionnaires, various sampling methods.

Statistical techniques for analyzing data: Measures of central tendency, measures of dispersion, measures of asymmetry (Skewness), measure of relationship, simple regression analysis, testing of hypotheses, chi-square test, analysis of variance (ANOVA) and Covariance (ANCOVA).

Reference Books:

1. Research Methods - Ram Ahuja, Rawat Publications
2. Philosophy of Science – Mario Bunge, Transaction Publishers
3. Research Methodology - Methods and Techniques, C. R. Kothari New Age
4. Fundamentals of Statistics - Goon, Gupta and Das Gupta (Vol. I & Vol. II)