

RESEARCH METHODOLOGY FOR SCIENCE

(Applicable to all the Science Departments)

Sub Code: 20RMSC01

UNIT 1- INTRODUCTION

Meaning and objective of scientific research-Type and significance of research-History-Evolution of scientific Inquiry-Verification versus falsification-Objectivity: Facts, theory and concepts – Philosophy of science and Technology, Epistemology of science -Construction of scientific facts, Methods of scientific research, Research process and criteria for good research, Stages of research. Defining and selecting the research problem

UNIT 2-RESEARCH DESIGN

Research Design – Need –Features –Inductive, Deductive 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

UNIT 3-DATA COLLECTION AND ANALYSIS

sources of Data : Primary ,Secondary and Tertiary – Types of Data – Categorical , nominal & Ordinal. Methods of Collecting Data –Data Processing and Analysis strategies- Graphical representation –Descriptive Analysis –Inferential Analysis –Correlation analysis –Least square method – Hypothesis –testing –Generalization and Interpretation –Modeling

UNIT 4 - SCIENTIFIC WRITING STRUCTURE AND COMPONENT OF SCIENTIFIC REPORTS

Structure and component of Reports –Types of Report – Technical Report and thesis – Significance – Different steps in the preparation –Layout, structure and Language of typical reports Illustrations and tables –Bibliography ,Referencing and foot notes –Conventions and strategies of Authentication – citation Style –sheet.

UNIT 5 - COMPUTER APPLICATIONS IN RESEARCH

Application of computer in Research MS office and its application in Research –MS Word , MS Power point and MS excel . Basic principles of statistical computation using SPSS, and computation (KMplot, Geogebra , Scilab , SageMath , GGAP and R)-Document preparation (LaTeX)-Presentation(Beamer)-Introduction of Bioinformatics tools and Application.

REFERENCE:

- Garg.B.L.,Karadia,R.,Agarwal,F. and Agarwal,U.K., 2002. AN introduction to Research Methodology , RBSA Publishers.
- Kothari,C.R.(2008).Research Methodology :Method and Techniques. Second Edition .New Age International Publishers , New Delhi . Sinha , S.C. and Dhiman,A.K.,2002.Research Methodology ,Ess Publication .2volumes.