

TRIBHUVAN UNIVERSITY
INSTITUTE OF SCIENCE AND TECHNOLOGY
SCHOOL OF MATHEMATICAL SCIENCES
Bachelor in Mathematical Sciences (B.Math.Sc.)

Course of Study

Code No.: MSST 451

Paper: **Research Methodology**

Nature: Theory

Full Marks: 75

Pass Marks: 30

Credit: 3

Course Description:

The course has a preliminary focus on problem identification, theoretical framework development and hypothesis formulation. The course will then deal with research design issues, measurement, sampling, data collection and analysis. This encompasses the overall understanding and application of appropriate research techniques and research statistics, and report writing and presentation skills.

Learning Objectives:

The objective of this course is to make students familiar with research techniques in social sciences. After completion of this course, the students will be able to carry out research work independently.

Mode of Delivery:

The course will be taught by lecture (48 hrs), and problem solving and class discussion (24 hrs). The use of spreadsheet software for problem solving will be encouraged.

Contents:

Unit 1 Introduction

8 hrs

Concept and types of research, Process and characteristics of scientific research, Emerging paradigms in research: quantitative and qualitative, positivist, and interpretive paradigms, Relations between research approaches and research methodologies, Business research: types, value for decision making, Ethical considerations in research. Concept, Features and assumptions of Qualitative research, Common practices in qualitative research, Methods of qualitative research: Case study, Ethnography, Grounded theory and phenomenological study, Building trustworthiness and credibility in qualitative research, Strength of qualitative research.

Unit 2 Beginning Stages in the Research Process

7 hrs

Literature Review: purpose and steps; Searching, obtaining, and evaluating the literature; Literature search through the Internet; Format and guidelines for presenting the literature review.

Theoretical Framework: Concept and need for research; Research and theory – deduction and induction; Contributions of research to theory building and practice.

Problem Definition: concept and steps in problem formulation; Research questions – concept and types.

Propositions and Hypotheses Formulation: Concept of Proposition; Functions of hypotheses; Types: descriptive, relational, directional, explanatory and null hypotheses; Criteria of good hypothesis statement.

Unit 3 Research Designs

7 hrs

Elements of a research design; Classification of research designs: exploratory; descriptive; developmental; case study; causal-comparative and experimental research designs; Common sources of error.

Unit 4 Measurement, Scaling and Sampling

8hrs

Variables- concept and types; Scales of measurement; Attitude measurement and scale construction; Attitude scales commonly used in social science research; Criteria of good measurement-validity and reliability of measurement; Sources of measurement problems; Sampling-concept and process; Population and sampling; Types of sampling-probability and non-probability sampling; Sampling and non-sampling errors.

Unit 5 Data Collection and Analysis

8 hrs

Data and its types; Sources of primary and secondary data; Important considerations for data collection; Questionnaire- principles, components and types; Research interview- types and process; Sources of qualitative data- observation, participant observation, focus groups; Use of Internet for data collection; Data analysis- Data processing; Presenting data in graphs and tables; Statistical analysis of data descriptive and inferential statistics; Hypothesis testing; Methods of analyzing qualitative data-content, thematic and narrative analysis.

Unit 6 Writing Proposals and Research Reports

10 hrs

Functions and types of research proposals: solicited and unsolicited proposals; Structure and contents of academic and funded research proposals. Research reports- concept, process, types and procedure for writing research report; Conventions of academic writing; Pre- writing concerns; Components of the research report; Body of the project; Documenting sources- APA style of citation and referencing; Evaluation of research reports; Essentials of good research report.

References

1. Zikmund, W. G. *Business Research Methods*, Thompson, New Delhi, India.
2. Cooper D. R. and Schindler P. S. *Business Research Methods*, Tata Mcgraw Hill, New Delhi.
3. Bryman, A. and Bell, E., *Business Research Methods*, Oxford University Press, New Delhi.
4. Pant Prem R., *Fundamentals of Business Research Methods*, Buddha Academic Enterprises, Kathmandu.
