

**THE WEST BENGAL UNIVERSITY OF HEALTH SCIENCES**  
**HOMOEOPATHY (POST GRADUATE DEGREE COURSE) M. D. (HOM)**  
**COURSE CURRICULUM UNDER THE NEW SYLLABUS AS PER AMENDED REGULATIONS OF**  
**CENTRAL COUNCIL OF HOMOEOPATHY**

**SUBJECT: RESEARCH METHODOLOGY AND BIOSTATISTICS**

**Research Methodology**

**1. Introduction to Health Research**

Definition of Research  
Characteristics of Research  
Why to do Research (Objectives)  
What are the types of Research?  
How to do Research?  
Measure areas of Health System Research  
Some of the problems encountered by the Research in Homoeopathy

**2. Identification of and Prioritisation of Research Problems / Areas**

Criteria for Prioritising Topics for Research  
Nominal Group Technique

**3. Literature Search**

Sources of Information: Homoeopathic Data Base & other Medical Research Data Bases

**4. Formulation of Objectives, Research Questions and Hypotheses**

Research objectives  
Research Questions  
Hypotheses  
Characteristics of Good Hypothesis  
Types of Hypotheses

**5. Planning the Measurements**

Measurements  
Scales of measurements  
Strategy to deal with threat to validity

**6. Study Designs**

Decision algorithm for choosing a study  
Observational /Non Interventional /Non Experimental studies  
Descriptive study design  
Analytical study design  
Experimental/Interventional studies  
Clinical Trials  
Randomised Controlled Trials  
Types of RCTs  
Principles to maximise follow up and adherence to the Protocol

## **7. Research on Diagnostic Tests**

- Lack of Information on Negative tests
- Lack of objective standard for Disease
- Consequences of imperfect standard
- Measures of Diagnostic Accuracy

## **8. Qualitative Research- Concepts and Methods**

- Purpose of Qualitative Methods
- Research Methods and Philosophical Perspectives
- How to do Qualitative Research?
- Classifications of Qualitative Research Procedures and Techniques
- Participatory Inquiry
- Focused Group Discussion

## **9. Measurements of Study Variables**

- Operationalisation of Variables by choosing appropriate Indicators
- Identifying indicators in Qualitative studies

## **10. Determination of Sample Size**

- Sample size Determination
- Sample size calculation for various epidemiological studies

## **11. Sampling Methods**

- Representativeness
- Probability or Random sampling strategies
- Non Probability sampling or Non Random sampling
- Bias in sampling
- Ethical considerations

## **12. Analysis of Quantitative Data**

- Descriptive statistics
  - Properties of frequency distributions
  - Central and Non central locations
  - Dispersion -Mean Deviations, Standard Deviations, Standard Error, Coefficient of Variation
- Inferential Statistics
  - Estimation Point and Period
  - Testing of Significance (both Parametric and Non parametric) for small as well as large Samples
  - Correlation and Regression

## **13. Analysis of Qualitative Data**

- Purpose of Qualitative Analysis

## **14. Data collection Methods and Techniques**

- Both for Primary and Secondary Data
- Experiencing (through observation and Field notes)
- Enquiry
- Examining
- Bias in Data Collection
- Ethical Considerations

## **15. Data Management Processing and analysis**

Data Quality Control and Management  
Data Screening  
Constructing a data base  
Data processing in Quantitative Data  
Quality Control tables and Cheque Lists

## **16. Ethical issues In Research**

Ethical principles in Research (General and Specific)  
Informed Consent  
Institutional Ethical Committee/Institutional Review Board  
Elements of Review  
Selection of special subjects as Research subjects (ICMR Guidelines )

## **17. Writing a Research Proposal**

Basic outline of a Research Proposal /Project  
Budget

## **18. Steps in Thesis Writing**

Scientific Structure Introduction Aims and Objectives , Materials and Methods,  
Results , Discussion Summary ,Conclusion

## **19. How to Write an Article for Publication ?**

Check List for Writing an Original paper

## **20. Critical Appraisal of Journal Article**

Need for Critical Review of Scientific Research Publication  
Method of Evaluation

## **21. Computer Applications in Research**

### **Biostatistics**

#### **1. Introduction to Biostatistics**

Definition (Meaning: Scope & Limitations)

#### **2. Data, Information, Intelligence**

Types of Data Qualitative Vs Quantitative; Primary Vs Secondary; Discrete Vs Continuous  
Data

Sources of Data

#### **3. Data collection Methods**

Primary Data

Direct Personal Investigation; Indirect oral Investigation; Information  
received through Local Agencies; Mailed Questionnaire Methods: Schedule  
Sent through Enumerator

Secondary Data

Published and Unpublished Sources

Measurement Scales Nominal; Ordinal; Interval and Ratio.

#### **4. Classification and Tabulation**

Array

Discrete or Ungrouped frequency Distribution

Grouped Frequency Distribution

Continuous Frequency Distribution

Basic Principle of Forming and Grouping Frequency Distribution

No. Type and Size of Class Interval

Less than and More than Cumulative Frequency Distribution

Tabulation Meaning and Importance: Parts of a Table

#### **5. Diagrammatic and Graphic Representation of data**

Difference between Diagrams and Graphs

Types of Diagrams (one, two and three Dimensional Diagrams) including Pictogram and Cartogram

#### **6. Descriptive Statistics**

Measures of Locations

Central Tendencies Mean; Median; Mode

Non Central Locations Quartiles; Deciles; Percentiles

Dispersions

Range

Mean Deviation

Standard Deviation

Standard Error

Variance

Covariance

Skewness and Kurtosis

#### **7. Theory of Probability**

Addition Law of Probability (For mutually Exclusive Events)

Multiplication Law of Probability

Inverse Probability (Bayes's Rule)

Probability Distribution of a Random Variable

Theoretical Distributions: Binomial Distribution; Poisson Distribution; Normal Distribution

#### **8. Inferential Statistics**

Estimation Point

Interval Estimation

Normal Distribution Curve

Confidence Interval

Level of Significance

Type I and Type II Error

Testing of Significance

Hypotheses Testing

Types of Hypotheses

#### **9. Tests of Significance (Both Parametric And Non Para Metric Tests)**

Large Sample Test (Z- Test)

Small Sample Test (both Paired and Unpaired Student t test)

F- Test and Analysis of Variance And Co Variance

Chi Square Test

Mac Nemar Test

Wilcoxon Signed Rank Test

ANOVA Test

## **10. Correlation and Regression**

- Correlation Coefficient
- Regression Line equation
- Regression Coefficients

## **11. Sampling Methods**

- Representativeness
- Probability or Random sampling strategies

- Simple Random Sampling
- Stratified Sampling
- Systematic Sampling
- Multiphase Sampling
- Multi stage Sampling
- Cluster Sampling

- Non Probability sampling or Non Random sampling

- Convenient Sampling
- Judgemental Sampling
- Quota Sampling
- Snow ball Sampling

- Bias in sampling

- Ethical considerations

## **12. Sample Size Calculation**

- Factors determining Sample Size Calculation
- Sample Size Calculation for various Study Designs

## **13. Reliability Vs Validity**

- Assessment of Validity: Sensitivity; Specificity; False Positive; False Negative
- Predictive value of a Positive Test; Predictive Value of a Negative Test
- Likely Hood Ratio

## **14. Demography and Vital Statistics Morbidity, Mortality, Fertility, etc.**

## **15. Statistical Softwares:**

- EXCELL; SPSS; EPIINFO; SAS; STRATA; etc.

**\*Note: This curriculum may be amended as and when required by this University.**