



MGM INSTITUTE OF HEALTH SCIENCES

(Deemed to be University u/s 3 of UGC Act, 1956)

Grade 'A' Accredited by NAAC

Sector-01, Kamothe, Navi Mumbai -410 209

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Coursework for Ph.D Programmes (Doctor of Philosophy)

(Till 2017-2018 Batches)

Approved as per AC-02/2007 Item No. 9.2 Dated 22/09/2007

Amended History

1. Approved as per AC-02/2007 Item No. 9.2 Dated 22/09/2007

Ph.D. Course

Ph.D. Course 101

RESEACH METHODOLOGY AND SCEINTIFIC WRITING

(45 Hrs)

Unit1. Research Process – Characteristics and Requirement

- Types of Research

Unit2. The Research Phases

- Phases –I Formulating a research problem
- Phases –II Planning a research problem
- Phases –III Conducting a research proposal Bio safety & Ethics Biomedical Research

Unit3. Reviewing the Literature

- The place of the literature review in research
Clarity and focus to research problem
Improving research methodology
Broadening your knowledge base in your research area
Enabling you to contextualize your findings
- How to review of the literature
Searching, reviewing of the literature
Developing a theoretical and conceptual framework

Unit4. Formulating a Research Problem

- Source, consideration and step in formulating a research problem
- Formulation of research objectives in qualitative research

Unit5. Identifying Variables

- Types of variable
- Types of measurement Scale

Unit 6. Constructing Hypotheses

- Definition, function, testing and characteristics of hypothesis
- Types of hypothesis

Unit 7. Conceptualizing a Research Design

- Research design- Function and theory of research design

Unit 8. Constructing an Instrument for Data Collection

- Selection a method of data collection
- Collection data using attitudinal scales
- Validity and reliability of a research instrument

Unit 9. Selecting a Sample

- Concept, sampling terminology principles of sampling
- Factor affecting the interferences
- Types of sampling- Non Random, non probability sampling design in quantitative research

Unit 10. Writing a Research Proposal

- How to write a research proposal
- Objectives, Hypotheses, Study design, Setting, Measurement procedures, Ethical issues.
- Sampling, Analysis of data, Structure of the report and problems and limitations

Unit 11. Writing a Research Report

- Writing a research report, developing an outline, writing about a variable Referencing, writing a bibliography and summary

Unit. 12. Ethical Issues in Research

- Basic Ethics Principles
- Essential Elements of Ethical Research
- Informed Consent
- Authorship Rules
- Research Misconduct
- Conflict of Interest

Recommended Books

1. Research Methodology by Kothari, C.R, 2009
2. Research Methodology by Bhattacharyya, Dipak Kumar, 2009
3. ABC of Research Methodology and Applied Biostatistics: A primer for clinicians and researchers by Parikh, M.N. and Gogtay, N, 2009
4. Essentials of Research Methodology & dissertation writing by Velikar, Kanan, 2009.
5. Research Methods in Business by Shah, Dhruv, 2010

Ph. D Courses

Ph.D. Courses -102

BIOSTATISTICS

Unit 1: Data Presentation

Graphs: - Histogram, Bar Charts: Simple and Multiple, Pie Chart, Problems and Interpretations of each.
Tables: Simple Table; Two way Multiway Table; problems elaborating each.

Unit 2: Measure of Central Tendency, Dispersion, Skewness and Kurtosis

Measure of Central Tendency: Arithmetic Mean, Median, Mode Measure of Dispersion: Variance, Standard Deviation, Standard error, Coefficient of Variation. Skewness: Discussion, Karl Pearson's co-efficient of Skewness, Kurtosis: Discussion. Note: Discussion of uses and interpretations is expected.

Unit 3: Correlation and Regression

Definition of Correlation for Bivariate Distribution. Types of Correlations, Positive Correlation, Negative Correlation, No Correlation. Methods for Identifying Types and Degree of Correlation, Scatter Diagram, Karl Pearson's Correlation Coefficient, Problems, Interpretations of Results, 'Rank Correlation, Limitations' of Correlations, Regression for Bivariate Distribution, Line of Regression, Regression Curves, Regression Coefficients, Properties of Regression Coefficients.

Unit 4: Testing of Hypotheses

Introduction: Assumption of Parametric test, General Hypotheses, Statistical Hypotheses, Simple and Composite Hypotheses, Null hypotheses, Alternative Hypotheses, Critical Region, Two Types of Error, Level of significance, Steps in Solving Testing of Hypotheses problem.

Unit 5: Exact Sampling Distribution I

Chi Square Test Definition: Application of Chi Square Test. Chi square Test for population variance. Chi Square Test for Goodness of Fit. Chi Square Test for independence of attributes (2 x 2 contingency table only). Yates Correction method (problems on Chi- Square with Yates correction need to be covered in practical session). Note on degrees of freedom problems.

Unit 6: Exact Sampling Distributions II

Parametric Test: t- test Definition Simple t- Test for mean and variance. Independent t- Test for Mean and variance. Paired t-Test for mean and variance. Problems on each Z- test. Definition: Z- Test for significance of difference for sample mean and Population Mean. Z- Test for significance of difference for sample variance and Population variance. Z Test for significance of difference for sample means of two group Z- Test for Significance of difference for sample variance of two groups Problems. ANOVA, one way ANOVA, Two way ANOVA, Problems. Non Parametric Test: Test of Randomness. Median Test, sign Test, Mann- Whitney- Wilcoxon U Test, Problems.

Recommended Books:

1. Methods in Biostatistics: for Medical Students and Research Workers by Mahajan, B.K., 2010
2. Biostatistics by Prabhakara, G.N. , 2008
3. Biostatistics simplified by Sarmukaddam, S.B., 2010
4. ABC of Research Methodology & applied Biostatistics: A Primer for clinicians & researchers by Parikh, M.N. and Gogtay N 2009, 2010.
5. Manual Biostatistics by Baride, J.P, 2003
6. Fundamental of Biostatistics by Sarmukkaddam , S.B. 2006
7. Instant Medical Biostatistics by Das, Ranjan and Das, P. N. , 2009
8. Manual of Biostatistics by Baride, J.P. and Kulkarni, A.P., 2003

(C) COURSE CONTENT FOR FUNCTIONAL KNOWLEDGE OF COMPUTER

(All three components shall have equal weight age)

1. Computer Fundamentals

- a. **Basis of Computer** : block structure of a computer, characteristic of computers, generation of computers classification of computers.
- b. **Types of Computers**: Mainframe computer, Mini and desktop computers, Laptop, Personal Digital Assistant, Networked computers in terms of capacity, speed, cost and end user's utility
- c. **Computer Performance**: Parameters that affect computer performance –CPU execution speed clock speed RAM Size Cache, Disc Capacity etc.
- d. **Character Codes**: ASCII ,EBCDIC

2. Elements of a computer Processing System

- a. **Processor**: Understanding some of the functions of the CPU in term of calculations, logical control and immediate access memory.
- b. **Storage Devices and Media**: Compare the main types of memory storage devices in terms of Speed, Cost and capacity such, as diskette, zip, data cartage, CD Rom, Internal- external hard disk, Magnetic Tape, Magnetic Disk.
- c. **Input- Device**: Various input devices: Mouse Keyboard, Trackball, Scanner, Touch Pad, light pen Joy Stick, Digital Camera and Microphone, etc.
- d. **Input-output Devices**: Touch Screens
- e. **Memory**: Understand different types of memory (RAM, ROM, EPROM, Flash RAM etc.) Measuring computer memory (BIT, BYTE, KB etc.)

3. Software :

- a. **Types of Software**: System software, Application software
- b. **Operating System Software**: Function of OS and brief introduction of some OS Batch Multi-Programming time sharing multiprocessing, PC operating system, network operating system , on-line and real time operating system.
- c. **Application software**: Common Application software such as: Word processing spreadsheet, database, web browsing Desktop Publishing
- d. **Programming paradigms and Languages**: Classification, Machine code, assembly language programming paradigms and higher level languages



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