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RESEARCH METHODOLOGY (RCW-01)

MM-100

UNIT-1 Research Aptitude: Meaning of Research, Objectives of Research, Motivation in Research, Types of Research, Research Approaches, and Research Methods versus Methodology, Research and Scientific Method, Importance of Knowing How Research is done. Research Process: Reviewing the literature, Formulation of research problem, Nature and type of variables, Hypothesis - meaning, types, development of hypothesis and its testing, meaning & Functions of Research Design **8 Hrs.**

UNIT-2 Data collection, Source of Data- Primary, Secondary and Tertiary Data, Methods of Collecting Data: Observation, Questionnaire, Interview, Attitude Scales, Interest Inventories - Construction and Standardization, Scaling Techniques- Different Types of Scales, Sampling - Different Types – Sampling Errors – Type 1 and Type 2 errors, Different Types of Variables, Population and sample, Sampling technique – concept, types (random, purposive, stratified random, probability and non- probability). **8 Hrs.**

UNIT-3 Data Analysis: Sources, acquisition and interpretation of data, Quantitative and qualitative data, Graphical representation and mapping of data, Sensitivity Analysis with Data Tables, Summarizing Data with histograms and descriptive Statistics, Pivot Tables, correlation, Regression Analysis, Inferential Analysis: Parametric and Non-parametric test, T-test, F-test, ANOVA, ANCOVA, Chi-square. **8 Hrs.**

UNIT- 4 Significance of Report Writing\; Different Steps in writing Report, Layout of the Research Report, Types of Report, Mechanics of Writing a Research Report, Art of scientific writing- Steps to better writing, flow method, organization of material and style, Drawing figures, graphs, tables, footnotes, reference etc. in a research paper, Preparing Research papers for journals, seminars and conferences Preparation of project proposal – Title, Abstract, Introduction: Rationale, objectives, methodology, Time frame and work plan - References **8 Hrs.**

UNIT- 5 Elements of Thesis, the first draft revisions, language and style, Title Page, Table of Contents, Approval Sheet, headings and sub-headings, footnotes, tables and figures, appendix, bibliography, the preliminaries, Typing Instructions Proof Reading etc. Plagiarism checking, Editing Citation and Referencing Styles, Aids for writing Good Research Report. **8 Hrs.**

References:

1. Research Methodology Methods and Techniques, Kothari, C.R., Wiley Eastern Ltd.
2. Microsoft Excel Data Analysis and Business Modelling, Wayne L. Microsoft Press, ISBN: 0735619018
3. Research Methodology: a step-by-step guide for beginners, kumar Pearson Education.
4. Practical Research Methods, Dawson, C., UBSPD Pvt.

Research Methodology, Sharma, N. K., KSK Publishers, New Delhi.



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Computer Application (RCW-02)

Marks 100

UNIT 1: Basics of Computer Organization

Introduction and need of Computers, Characteristics of Computers, Evolution of computers, computer generations, basic computer organization; system software and application software, introduction to operating system, MS-Window, DOS, UNIX, Linux, classifications of computer Operating system and basics of Windows, User Interface, File management, File Transfer (FTP). **10 Hrs.**

UNIT 2: Data Communication and Network Security

Data communication concepts, local area network, wide area network, internet, intranet, Network Threats, Authentication & Access Control Mechanism, Secured Communication Mechanisms, Biometric, Secured Design for LAN, Firewall, Intrusion Detection System, Virtual Private Network, Email and Web Security. WEP, Access Controls, Secure Socket Layer, IPSEC, WAP Security, Security Issues, Challenges & Defines Mechanisms for Bluetooth, GSM, CDMA, GPRS, Wi-Fi Wi-Max. **10 Hrs.**

UNIT 3 : Using Internet for Research: The Internet: quick look, what is internet, Use of Internet major internet services, electronic mail, www, downloading super tools to better computing Internet and the society, Use of E-Journals, Use E-library, searching the keyword search engines, News and multimedia, governments archives and statistics, Introduction to Information storage and retrieval systems: IPR, Digital Libraries, approved Journals, and repositories, Introduction to Copyright, plagiarism in research, Ethics in general, Professional Ethics, Ethical Issues that Arise from Computer Technology, Copyright and plagiarism reports, and other ICT tools for research. **10 Hrs.**

UNIT 4: Introduction to Research Related Tools and Utilities

Introduction to data analysis software- SPSS, MATLAB, Scilab and LaTeX, objectives and features, data analysis using SPSS: Data entry creating variables, switching to data labels, data analysis, MS-Office and its application, File handling in window, various versions of MS Office, Research publishing tool- MS-Word, Adobe Acrobat, Graphics tool- MS Excel, MS-Power Point: Creating presentation, master page, adding animation Customizing presentation, showing presentation, printing handouts. **10 Hrs.**

Suggested Readings:

1. Computer Fundamental by P K Sinha, BPB Publication
2. Fundamentals of Information Technology, A Ravichandran, Khanna Book publishing Co. (P) Ltd.
3. Cryptography and Network Security, Principles and Practice, William Stallings by Pearson education.
4. Fundamentals of Biostatistics- Khan and Khanna, Ukaz Publication.
5. C.S. French “Data Processing and Information Technology”, BPB Publications 1998
6. Network Security, Compete Reference, Tata Mc-Graw Hill



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Research and Publication Ethics (RCW-03)

Marks 100

UNIT 1: PHILOSOPHY AND ETHICS

(5 Hrs.)

Introduction to philosophy : definition, nature and scope, concept, branches
Ethics: definition, moral philosophy, nature of moral judgements and reaction

UNIT 2: SCIENTIFIC CONDUCT

(8 Hrs.)

Ethics with respect to science and research
Intellectual honesty and research integrity
Scientific misconducts: Falsification, Fabrication, and overlapping publication, salami slicing
Redundant publications: duplicate and overlapping publications, salami slicing
Selective reporting and misrepresentation of data

UNIT 3: PUBLICATION ETHICS

(15 Hrs.)

Publication ethics: definition, introduction and importance
Best practices / standards setting initiatives and guidelines: COPE, WAME, etc.
Conflicts of interest
Publication misconduct: definition, concept, problems that lead to unethical behaviour and vice versa, types
Violation of publication ethics, authorship and contributorship
Identification of publication misconduct, complaints and appeals
Predatory publishers and journals

UNIT 4: OPEN ACCESS PUBLISHING

(6 Hrs.)

Open access publications and initiative
Sherpa/RoMEO online resource to check publisher copyright & self-archiving policies
Software tool to identify predatory publication developed by SPPU
Journal finder / Journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggested, etc.

UNIT 5: PUBLICATION MISCONDUCT

(6 Hrs.)

Subject specific ethical issues, FFP, authorship
Conflicts of interest
Complaints and appeals: examples and fraud from India and abroad
Software tools- Use of plagiarism software like Turnitin, Urkund and other open source software tools