HOLKAR SCIENCE COLLGE, INDORE
M.Phil. - Computer
SEMESTER-I (2011-12)
PAPER-I
MP 101 RESEARCH METHODOLOGY

UNIT- I: Introduction to research

1. Definition, objectives, motivation, types of research, approaches, utility of research. qualities of a good researcher
2. Problems encountered by researchers in India.
3. Hypothesis development.
4. Laboratory safety, bio safety, recombinant material safety.

UNIT- II: Experimental designs

1. The laboratory and the field experiment – internal and external validity – factors affecting internal validity.
2. Measurement of variables – scales and measurements of variables.
3. Developing scales: rating scale and attitudinal scales. Validity testing of scales developed.
4. Reliability concept in the scales being developed. Stability measures.
5. In vitro, in vivo and clinical trial designs,
6. Rules and regulation for animal and human experiments.

UNIT- III: Data collection methods

1. Schedule (purpose, essentials, procedure, design),
2. Interviews questionnaires, Guidelines for Questionnaire design – electronic questionnaire design and surveys. observation, inferences
3. Special date sources: focus groups, static and dynamic panels.
4. Sampling techniques. Probabilistic and non –probabilistic samples.
5. Issues of precision and confidence in determining sample size.
6. Hypothesis testing.
7. Determination of optimal sample size.
8. Data relevance to intellectual property rights (IPR), bookkeeping.

UNIT- IV: Statistical Techniques

1. Types of data – Collection and presentation of data (Table, Graphs, Diagrams).
2. Measures of central tendency
3. Skewness and Kurtosis;
4. Basic probability conceps & Probability analysis
5. Testing of significance – Goodness of fit (X2 test) – Student's – test –,f test, z test, Simple & multiple regression &Correlation &Correlation coefficient
6. ANOVA (one way and two way analysis).
7. Application of SPSS package.
8. Application of MetLab package.

UNIT- V: The Research Report

The purpose of the written report – concept of audience – Basics of written reports. The integral parts of a report – the little of a report, the table of contents, the synopsis, the introductory section, method section, results section – discussion section – recommendations and Implementation section and reference section.

Books recommended

1. Donald R. Cooper and remela S. Schindler, Business Research Methods, Tata McGraw Hill publishing company limited, New Delhi, 2000.
2. C.R. Kothari, Research Methodology, Wishva Prakashan, New Delhi,
3. Donald H. McBurney, research methods, Thomson Asia Pvt. Ltd. Singapore, 2002
4. G.W. Ticehurst and A.J. Veal, Business research methods, Longman, 1999.
5. Ranjit Kumar, Research methodology, Sage Publications, London, New Delhi, 1999.

HOLKAR SCIENCE COLLGE, INDORE
M.Phil. - Computer
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PAPER-II
MP 102 Simulations and Modeling

Unit-I
Introduction to Modeling and Simulation

Nature of Simulation. Systems , Models and Simulation, Continuous and Discrete Systems, system modeling, concept of simulation, Components of a simulation study, Principles used in modeling ,Static and Dynamic physical models, Static and Dynamic Mathematical models Introduction to Static and Dynamic System simulation , Advantages ,Disadvantages and pitfalls of Simulation.

Unit-II
System Simulation and Continuous System Simulation

Types of System Simulation, Monte Carlo Method, Comparison of analytical and Simulation methods, Numerical Computation techniques for Continuous and Discrete Models, Distributed Lag Models, Cobweb Model. Continuous System models, Analog and Hybrid computers, Digital-Analog Simulators, Continuous system simulation languages ,Hybrid simulation ,Real Time simulations.

Unit –III
System Dynamics & Probability concepts in Simulation

Exponential growth and decay models, logistic curves ,Generalization of growth models , System dynamics diagrams, Multi segment models , Representation of Time Delays. Discrete and Continuous probability functions, Continuous Uniformly Distributed Random Numbers, Generation of a Random numbers, Generating Discrete distributions, Non-Uniform Continuously Distributed Random umbers, Rejection Method.

Unit-IV
Simulation of Queueing Systems and Discrete System Simulation

Poisson arrival patterns, Exponential distribution, Service times, Normal Distribution Queuing Disciplines, Simulation of single and two server queue. Application of queuing theory in computer system . Discrete Events ,Generation of arrival patterns ,Simulation programming tasks , Gathering statistics, Measuring occupancy and Utilization , Recording Distributions and Transit times .

Unit-V
Introduction to Simulation languages and Analysis of Simulation output

GPSS: Action times, Succession of events, Choice of paths, Conditional transfers, program control statements.
SIMSCRIPT: Organization of SIMSCRIPT Program, Names & Labels, SIMSCRIPT statements.Estimation methods, Relication of Runs, Batch Means, Regenerative techniques, Time SeriesAnalysis, Spectral Analysis and Autoregressive Processes.

References:

- Gorden G., System simulation, Prentice Hall.
- Seila, Simulation Modeling, Cengage Learning
- Law .,Simulation Modeling And Analysis, McGraw Hill
- Deo, System Simulation with Digital Computer, PHI
- Harrington, Simulation Modeling methods, McGraw Hill
- Severance, " System Modeling & Simulation, Willey Pub

HOLKAR SCIENCE COLLGE, INDORE

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PAPER-III

MP 103 Advance Database Management System

UNIT 1

DBMS Concepts Introduction, Data models, Entities and attributes, Relationships, E-R diagram. Relational Data models: Domains, Tupples, Attributes, Keys, Relational database, Schemas, Integrity constraints. Relational algebra and relational calculus, Normalization, Normal forms.

UNIT 2

Query Processing and Optimization. Distributed databases: Fragmentation, Replication, Location & Fragment transparency, Distributed Query Processing and Optimization.

UNIT 3

Object oriented and object relational databases: Specialization, Generalization,

Aggregation,

UNIT 4

Association. Introduction to Image and Multimedia databases and data structures. Data structure- R tree, K d tree, Quad trees, Content based retrieval: Color Histograms.

UNIT 5

Web databases: Accessing databases through web

Reference Books:

1. R. Elmasri, S. Navathe, Fundamentals of Database System, Benjamin Cummings
2. C.J. Date, An Introduction to Data base Systems, Volume I, Addison Wesly
3. H. F. Korth and A. Silberschatz. Database Concept, TMH
4. Object Oriented databases :Narang, Prentice-Hall of India, New Delhi
5. Rob, Database Systems, Cengage, (Thomson)
6. Pratt, Concepts of DBMS, Cengage.

HOLKAR SCIENCE COLLGE, INDORE

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PAPER-IV

MP 104 Object Oriented Modeling and Technology

UNIT 1

Object Oriented Concepts and Modeling Techniques Modeling, objects and classes, Relationships, Inheritance, Association, aggregation, Containers, Delegation, Metadata, Abstract methods and Classes.

UNIT 2

Object modeling, Dynamic modeling, Events, Status, Scenarios, Event hate diagrams, Operations, State diagrams, Functional Models, Dataflow diagrams, Constraints specification, Relation of object, Functional and Dynamic models.

UNIT 3

Design Methodology: OMT methodology, Analysis, Overview of system design, Subsystem, concurrency, Common architectural frameworks designing algorithm, Design optimization, Implementation of control, Design of Associations, Object design, Class design, Comparison of design methodology with SASD, JSD and others.

UNIT 4

Implementation Programming style, Reusability, Extensibility, Programming in the large, Translating a design into an Implementation class definition, Object oriented Language features, Survey of object-oriented languages, Object storage and relation with database.

UNIT 5

Advanced Topics Distributed objects, Components development, Introduction to Distributed object system like CORBA, EJB, COM+, DCOM, and other design architectures.

References:

G. Booch, Object-Oriented Analysis and Design, Pearson Education.

J. Rumbaugh, Object-Oriented Modeling and Design, Pearson Education